

1ST AND 2ND ORDER

PROCESSES AND PROPERTIES INDEX

COMMON ELEMENTS

OPEN

MATERIALS INDEX

EXCHANGE ADSORPTION OF IONS BY COLLOIDAL IRON OXIDE. V. A. Kargin and G. V. Kiseleva. (U. S. S. R.) 11, 461-4 (1938).—Spectrophotometric investigation of a sol contg. 1.05 g./l. of  $\text{Fe}_2\text{O}_3$  and Cl ion 0.05 g./l. and of pH 4.48. disclosed that in the coagulation of  $\text{Fe}_2\text{O}_3$  with  $\text{K}_4\text{Fe}(\text{CN})_6$  or  $\text{KCNS}$ , the corresponding Fe salts were not formed; therefore, the surface of the particles contained no ferric ion. The investigation of sol No. 2 contg.  $\text{Fe}_2\text{O}_3$  0.009 and Cl ion 0.009 g./l. at pH = 3.1, disclosed that at the moment of introduction of  $\text{K}_4\text{Fe}(\text{CN})_6$  or  $\text{KCNS}$  the Prussian-blue or  $\text{Fe}(\text{CNS})_3$  was formed although the soln. became somewhat brownish. However, the coloration gradually changed and after a few hrs. the formation of Prussian-blue was observed by means of the adsorption spectrum. Twelve references. A. A. P.

EXCHANGE ADSORPTION OF IONS BY COLLOIDAL IRON OXIDE. V. A. Kargin and G. V. Kiseleva. (U. S. S. R.) 11, 467-472 (1938).—The amounts of  $\text{SO}_4^{2-}$  adsorbed and of  $\text{Cl}^-$  liberated during the coagulation of  $\text{Fe}(\text{OH})_3$  sol by  $\text{Na}_2\text{SO}_4$  and by  $\text{H}_2\text{SO}_4$ - $\text{Na}_2\text{SO}_4$  and  $\text{Na}_2\text{SO}_4$ - $\text{NaOH}$  mixtures were measured. J. J. B.

ASS-SLA METALLURGICAL LITERATURE CLASSIFICATION

FROM SYNDICATE

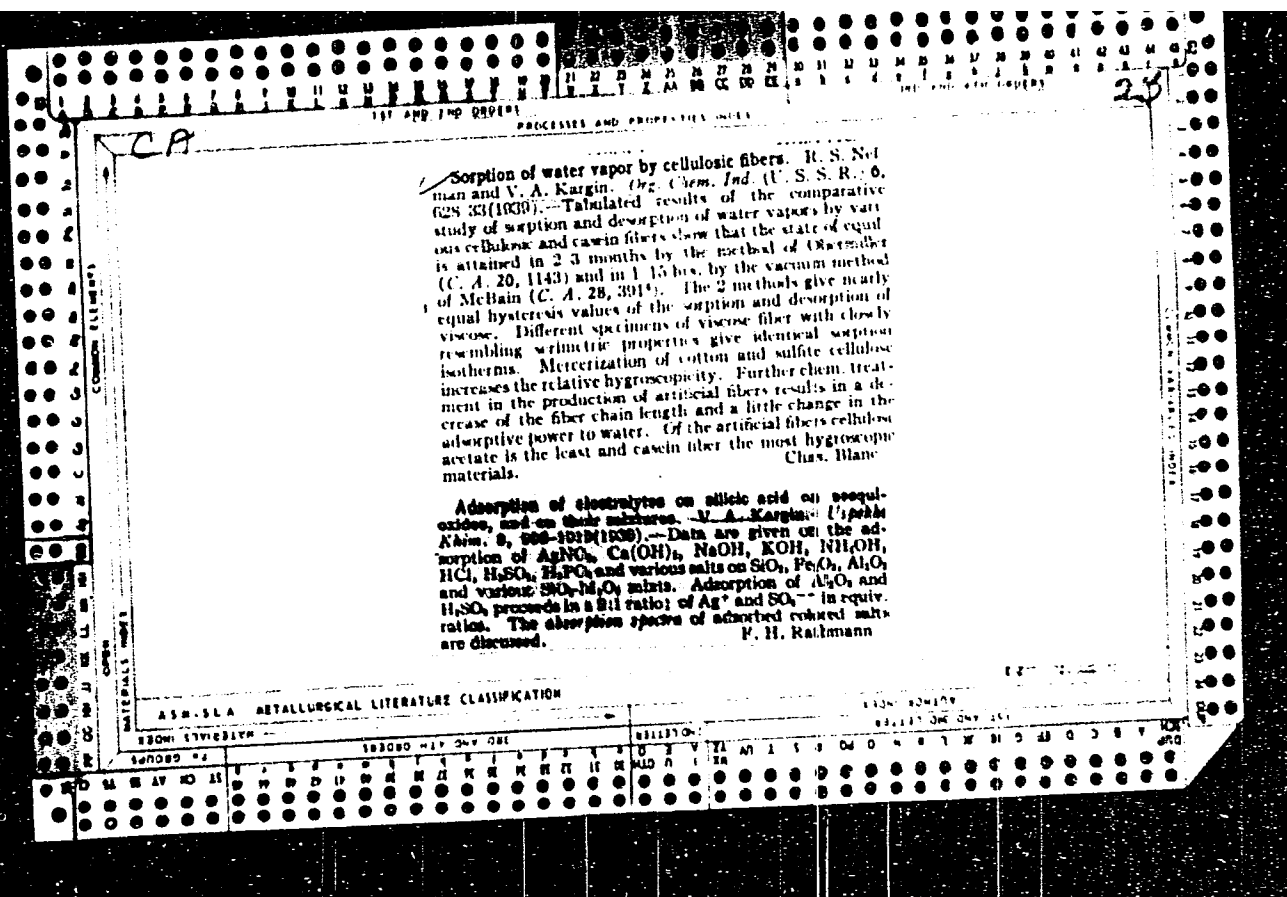
SECONDARY ONLY ONE

REVISIONS

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1ST AND 2ND ORDERS										3RD AND 4TH ORDERS									
PROCESSES AND PROPERTIES INDEX																			
CA										23									
<p>Production of fiber from hydroxyethylcellulose. V. A. Kargin and Z. V. Ukhanova. <i>Tekhn. Byull. GUV</i> 1939, No. 2, 29-31; <i>Khim. Referat. Zhur.</i> 1940, No. 7, 111.— Two methods for producing fiber possessing normal tensile strength (in both the dry and the wet states) from hydroxyethylcellulose were investigated: by decreasing the amt. of ethylene oxide during esterification of alkali cellulose and by introducing some addl. substances into the spinning solns. of hydroxyethylcellulose with a special treatment of the finished fiber. Fiber of higher tensile strength can be obtained by selecting the proper spinning soln. and by decreasing the amt. of ethylene oxide during esterification.</p> <p>W. R. Henn</p>																			
ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION																			
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FOURTH ORDER ONLY ONE										FIFTH ORDER ONLY ONE									



1ST AND 2ND ORDERS																										3RD AND 4TH ORDERS																									
PROCESSES AND PROPERTIES INDEX																										COMMON SYMBOLS INDEX																									
<p><i>Ca</i></p> <p><i>No. 3</i></p> <p>X-ray study of the orientation of artificial fibres. I. V. A. Kargin and N. V. Mikhailov. <i>Acta Physicochim.</i> U.S.S.R. 11, 643-60 (1939) (in English).—Exptl. data on the strength and percentage elongation of wet and dry samples of cuprammonium rayon and viscose rayon variously prep'd. and treated are given. In contrast to the theory of Mark and Meyer (cf. C. A. 23, 1263), K. and M. hold, on the basis of these data, that the true equil. state is one in which the chain aggregates are in a more or less disordered arrangement, and that the elongation-approach to a true crystal is an unstable state. Highly swollen gelatin contg. only 2% <math>\alpha</math>-cellulose shows 2 to 3-fold elongation and, like rubber, almost instantaneous shrinking. F. H. Rathmann</p>																										<p><i>25</i></p>																									
<p>ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>																										<p>COMMON SYMBOLS INDEX</p>																									



1ST AND 2ND ORDERS										3RD AND 4TH ORDERS									
PROCESSES AND PROPERTIES INDEX																			
<p><i>ca</i></p> <p>Exchange adsorption on colloidal titanium dioxide. V. A. Kargin and M. Tolstaya. <i>J. Phys. Chem.</i> (U. S. S. R.) 13, 211-15(1939).—Exptl. data on the adsorption of <math>H_2SO_4</math>, <math>Na_2SO_4</math>, and <math>NaOH</math> on a <math>TiO_2</math> soln. obtained by hydrolysis of <math>TiCl_4</math> and partial dialysis are given. For sols with a low <math>Cl^-</math> content, the adsorption of <math>SO_4^{2-}</math> with respect to the pH is given by the usual adsorption isotherm; for large concns. of <math>Cl^-</math>, the adsorption isotherm becomes S-shaped, as with iron oxides. Cf. K. and Klimovitskaya, <i>C. A.</i> 33, 4105. F. H. Rathmann</p>																			
<p>ASS-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>																			
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1ST AND 2ND ORDERS										3RD AND 4TH ORDERS									
PROCESSES AND PROPERTIES INDEX																			
<p><i>CA</i></p> <p>Investigation of structure of surface of fibers by diffraction of fast electrons. <u>Y. A. Kargin</u> and D. I. Lel'punskaia. <i>J. Phys. Chem.</i> (U. S. S. R.) 43, 850(1939).— Diffraction expts. show that the surface layer of fibers of viscose rayon of a low degree of av. orientation (as shown by x-ray investigation) is highly oriented, but this disappears on prolonged treatment with hot <math>H_2O</math>. The surface layer of bleached cotton fibers is not highly oriented, but the natural fiber exhibits sharp interferences, apparently arising from the cuticle. B. C. P. A.</p>																			
<p>2</p>																			
<p>ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>																			
<p>SECTION 1: STEEL</p>										<p>SECTION 2: ALUMINUM</p>									
<p>SECTION 3: COPPER</p>										<p>SECTION 4: ZINC</p>									
<p>SECTION 5: NICKEL</p>										<p>SECTION 6: TITANIUM</p>									
<p>SECTION 7: IRON</p>										<p>SECTION 8: STEEL</p>									
<p>SECTION 9: ALUMINUM</p>										<p>SECTION 10: COPPER</p>									
<p>SECTION 11: ZINC</p>										<p>SECTION 12: NICKEL</p>									
<p>SECTION 13: TITANIUM</p>										<p>SECTION 14: IRON</p>									
<p>SECTION 15: STEEL</p>										<p>SECTION 16: ALUMINUM</p>									
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<p>SECTION 19: NICKEL</p>										<p>SECTION 20: TITANIUM</p>									
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<p>SECTION 23: ALUMINUM</p>										<p>SECTION 24: COPPER</p>									
<p>SECTION 25: ZINC</p>										<p>SECTION 26: NICKEL</p>									
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<p>SECTION 29: STEEL</p>										<p>SECTION 30: ALUMINUM</p>									
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<p>SECTION 87: COPPER</p>										<p>SECTION 88: ZINC</p>									
<p>SECTION 89: NICKEL</p>										<p>SECTION 90: TITANIUM</p>									
<p>SECTION 91: IRON</p>										<p>SECTION 92: STEEL</p>									
<p>SECTION 93: ALUMINUM</p>										<p>SECTION 94: COPPER</p>									
<p>SECTION 95: ZINC</p>										<p>SECTION 96: NICKEL</p>									
<p>SECTION 97: TITANIUM</p>										<p>SECTION 98: IRON</p>									
<p>SECTION 99: STEEL</p>										<p>SECTION 100: ALUMINUM</p>									


1ST AND 2ND CODES										3RD AND 4TH CODES									
<p><b>ABSTRACT AND PROPERTY INDEX</b></p> <p>adsorption of electrolytes on highly purified aluminum oxide and ferric oxide gels. Z. Ya. Beretneva and V. A. Kargin. <i>J. Phys. Chem. (U. S. S. R.)</i> 18, 1628 34 (1974).</p> <p>Exptl. data on the adsorption of <math>\text{Na}_2\text{SO}_4</math>, <math>\text{NaCl}</math>, <math>\text{HCl}</math>, <math>\text{H}_2\text{SO}_4</math>, and <math>\text{H}_3\text{PO}_4</math> from 0.001 <i>N</i> aqns. on pure <math>\text{Al}_2\text{O}_3</math> and <math>\text{Fe}_2\text{O}_3</math> gels as crit. by potentiometric titration are shown as functions of the residual concns. and H-ion activities. The max. amts. adsorbed, and the residual equil. concns. found, are: <math>\text{Na}_2\text{SO}_4</math>, 0.005 mg. equiv./l., <math>14.66 \times 10^{-6}</math> g. equiv./l.; <math>\text{NaCl}</math>, 0.00086, 19.3; <math>\text{NaH}_2\text{PO}_4</math>, 0.0 up to 16.7, on an <math>\text{Al}_2\text{O}_3</math> gel contg. 10.77 g./l. On other gels adsorption was less. Up to equil. concns. of <math>10^{-4}</math> g. equiv./l. the acids are almost completely adsorbed by both types of gels. <math>\text{H}_2\text{SO}_4</math> most strongly, <math>\text{HCl}</math> least. Addn. of <math>\text{HCl}</math> to <math>\text{Na}_2\text{HPO}_4</math> solns. increases the adsorption of phosphate ion as</p> <p><math>\text{H}_2\text{PO}_4^-</math>; addn. of <math>\text{Na}_2\text{HPO}_4</math> to a gel contg. adsorbed <math>\text{HCl}</math> liberates <math>\text{HCl}</math> and exchange adsorption of phosphate takes place. It is found that these results confirm previous work and views as to exchange adsorption and its significance in soil problems. Cf. C. A. 32, 5678, 7708; 33, 6116.</p> <p>F. H. Rathmann</p>																			
<p><b>ADDITIONAL METALLURGICAL LITERATURE CLASSIFICATION</b></p>																			
<p><b>1ST AND 2ND CODES</b></p>										<p><b>3RD AND 4TH CODES</b></p>									

1ST AND 2ND COLUMNS										3RD AND 4TH COLUMNS									
<p><i>cd</i></p> <p><b>ABSORPTION AND PROPERTIES INDEX</b></p> <p>Adsorption of silver salts on mixed silica gel-trivalent metal oxide gels. V. A. Kargin, P. S. Vasil'ev and O. I. Dmitrievskii. <i>J. Phys. Chem. (U. S. S. R.)</i> 13, 1837-38 (1959). — From exptl. data it is found that the adsorption of <math>\text{Ag}_2\text{SO}_4</math> on the systems <math>\text{mM}_2\text{O}_3 \cdot \text{nSiO}_2</math> where <math>\text{M} = \text{Al}</math> or <math>\text{Fe}</math>, <math>m</math> and <math>n</math> vary from 1 to 4, (<math>m/n</math>) from <math>1/4</math> to 2, proceeds in equiv. amts. with respect to both ions and in mol. in nature. The mixed gels were highly purified and gave pH values from 5.38 to 6.09. Conclusion: Such mixed gels cannot cause H-ion exchange in soils. F. H. Rathmann</p> <p><i>Div. of Colloidal Chem., Karpov Phys. Chem. Inst., Moscow</i></p>																			
<p>ASB-11A DETALLURGICAL LITERATURE CLASSIFICATION</p>																			
<p>RECORD SYMBOL</p>										<p>RECORD SYMBOL</p>									
<p>RECORD SYMBOL</p>										<p>RECORD SYMBOL</p>									

1. KARGIN, V.; PAFKOV, S.; ROGOVIN, Z.

2. USSR (600)

"The Solubility of Compounds of High Molecular Weight -- V. General Characteristics of Solutions of Compounds of High Molecular Weight"; Zhur. Fiz. Khim. 13, No. 2, 1939; Institute of Synthetic Fibers, Mytishchi; Rec 19 May 1938.

9.  Report U-1613, 3 Jan. 1952.

23

CA

The amorphous structure of cellulose and its derivatives.  
V. A. Kargin and P. V. Korlov. *Kanofizika. Prom.*  
1940, No. 4, 40-6. — A brief review of the various theories  
concerning the structure of cellulose and its derivs. On  
the basis of x-ray and electron-diffraction studies it is  
concluded that the equil. state of cellulose is an amorphous  
structure and that structures approaching the cryst. state  
are unstable, tending toward the amorphous state. The  
most favorable state is described as an oriented state in  
which the chains as a whole are oriented, the individual  
chains being curved rather than straight.  
W. R. Eichler and R. L. Griffith

ASM 51.4 METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS																										3RD AND 4TH ORDERS																									
PROCESSIES AND PROPERTIES INDEX																																																			
<div style="display: flex; justify-content: space-between;"> <span>CA</span> <span>2</span> </div> <p>Investigation of the surface of colloidal zirconium dioxide sol particles. V. A. Kargin and V. V. Kiseleva. <i>Acta Physicochim. U. R. S. S. R.</i> 12, 377-400 (1940) (in German).— Exptl. data are given in 6 tables and figures on the absorption spectra of methylene blue and erythrocin adsorbed on <math>ZrO_2</math> sols in various solns. of varying pH. From the constancy of the spectra, it is concluded that the potential-determining ion is the cation <math>[Zr(O_2)_{11}O]^{++}</math> and that no more complex compds. are found on the sol surface. F. H. Rathmann</p> <p>Surface of colloidal particles in titanium dioxide sols. V. V. Kiseleva and V. A. Kargin. <i>Acta Physicochim. U. R. S. S. R.</i> 12, 400-405 (1940).— Erythrocin, methylene blue and Thionine Blue were added to dialyzed sols of <math>TiO_2</math> in aq. solns. such that adsorption of the dye was complete irrespective of the sign of the charge on the colloid. The resulting changes in the absorption spectrum of the dyes are independent of the pH of the intermicellar liquid and are detd. solely by the compn. of the adsorption layer. The observations are interpreted in terms of ionic exchange. H. C. P. A.</p>																																																			
ABO-SLA METALLURGICAL LITERATURE CLASSIFICATION																																																			
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23

Diffraction of rapid electrons in thin films of cellulose hydrate. V. A. Kargin and D. I. Lel'puns'kaya. *Acta Physicochim. U. R. S. S. R.* 12, 397-410 (1940) (in German). — On the basis of exper. data on denitrated nitrocellulose, K. and L. conclude that the usual interpretation of x-ray photographs in terms of inter- and intra-molecular structure of the polymorphism and of the crystal magnitudes of cellulose is wrong. F. H. Rathmann

The laws of deformation of real materials. II. The deformation of high polymers. V. A. Kargin and O. L. Stokimskii. *Acta Physicochim. U. R. S. S. R.* 12, 931-40 (1940) (in German); cf. C. A. 33, 8375. — Discussion from the viewpoint of the Boltzmann-Volterra theory of deformation. H. C. Thomas

ASS-SLA METALLURGICAL LITERATURE CLASSIFICATION

RECORD #	RECORD MAY ONLY USE	RECORD ONLY	RECORD ONLY USE
1	2	3	4
5	6	7	8
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89	90	91	92
93	94	95	96
97	98	99	100



CA

23

PROCESSES AND PROPERTIES INDEX

The change in viscosity of nitrocellulose by the action of ammonia and ammonium hydroxide. R. Chernitskaya, V. A. Kargin and D. I. Gutermakher. *J. Applied Chem.* (U. S. S. R.) 13, 1189-94 (in French, 1184) (1940).-  $\text{NH}_3$  reacts with the  $\text{NO}_2$  of nitrocellulose yielding colored products. This reaction can proceed in the absence of water or O but requires a temp. of about  $60-65^\circ$ . The action is accompanied by destruction of the nitrocellulose, which, in turn, causes a lowering of the viscosity. Therefore, the  $\text{NH}_3$  method for lowering viscosity has no advantages over other methods based upon a destruction of the product. A. A. Podgorny.

ATB-11A METALLURGICAL LITERATURE CLASSIFICATION

1940-1949

1950-1959

1960-1969

1970-1979

1980-1989

1990-1999

2000-2009

2010-2019

2020-2029

2030-2039

2040-2049

2050-2059

2060-2069

2070-2079

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2130-2139

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<p>CA</p> <p>23</p> <p><b>X-ray diffraction investigations of the orientation of artificial fibers. II. Stability of oriented fibers of cellulose hydrate.</b> N. V. Mikhailov, V. A. Kargin and V. M. Bukhman. <i>J. Phys. Chem. (U. S. S. R.)</i> 14, 205-7 (1940); cf. <i>C. A.</i> 34, 28073.—Fibers of viscose rayon spun under high tension and of cuprammonium rayon were studied. The results were entirely different from the previously reported ones in which weakly oriented viscose was studied. These fibers were all highly oriented; upon boiling in H<sub>2</sub>O their orientation was either entirely un-</p> <p>affected or decreased but slightly, even for prolonged (13 hr.) treatment. The only apparent difference between these and the previously reported fibers lies in the fact that one set of fibers is oriented in the process of its formation, whereas the other (weakly oriented viscose) is oriented by tension after the fiber was formed. Thus, apparently the fiber tends to regain its initial state, this tendency being facilitated by a process such as prolonged boiling with H<sub>2</sub>O. A brief theoretical discussion is presented in which as yet unknown types of bonding are postulated which "fix" orientation in a fiber at the moment of its formation; it is believed that these bonds are some type of an ether linkage, but owing to lack of direct evidence no proof can be offered. Orientation by stretching of a formed fiber is considered to be a form of elastic elongation producing only temporary changes of mechanical properties of the fiber.</p> <p>G. M. Kosolapoff</p> <p><i>X-ray Lab, Sci. Res. Inst. Synthetic Fibers</i></p> <p>ASTM 51.4 METALLURGICAL LITERATURE CLASSIFICATION</p>																									
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Effect of the solubility of silver salts on their adsorption by composite gels of silica and coaguloxides. V. A. Karagin, P. B. Vashlev and O. I. Dmitrenko. *J. Phys. Chem.* (U. S. S. R.) 16, 1028-30(1940); cf. C. A. 35, 3021. The magnitude of adsorption of Ag ions from salt mixts. by gels of  $Fe_2O_3$ ,  $Fe_2O_3 + 2SiO_2$ , and  $Al_2O_3 + SiO_2$  usually is larger when a slightly sol. Ag salt can be formed. Thus,  $Na_2SO_4$  raises the adsorption of Ag ions from  $AgNO_3$  more than  $NaOAc$  or  $NaNO_3$  does, since  $Ag_2SO_4$  is less sol. than  $AgOAc$  or  $AgNO_3$ . This effect can be masked by competition between Na and Ag ions for the adsorption space. From a soln. of  $Ag_2SO_4$  alone the Ag ion is adsorbed more than from  $AgNO_3$  alone, and the adsorption isotherm often rises at high concns. like those of nearly satd. vapors. H. C. P. A.

PROCESS AND PROPERTIES INDEX																									
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<p>CA</p> <p>Rayon and films. V. A. Kargin and E. A. Kuril'chikov. Russ. 50,382, March 31, 1941. The water resistance of products obtained from hydroxyethylcellulose or its xanthate is improved by adding water glass to the alk soln. of the cellulose deriv.</p>													<p>23</p>												
<p>ASAC 214 DETAILING LITERATURE CLASSIFICATION</p>																									
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1ST AND 2ND SERIES		SUBCROSS AND PROPERTIES INDEX		3RD AND 4TH SERIES	
<p><b>CA</b></p> <p>Processes of viscous flow in the deformation of high-polymer materials. V. A. Kargin and G. L. Slonimskii (Karpov Phys. chem. inst., Moscow). <i>Abad. Nauk S.S.S.R., Otd. Tekh. Nauk, Inst. Mashinostroyeniya, Soveshchaniye po Vysokosti Zhidkosti i Kolloid. Rastvorov (Conf. on Viscosity of Liquids and Colloidal Solutions.)</i> 1, 101-21 (1941).—In nonequilibrium, deformations, elasticity and flow depend on the time or rate factor, and consequently do not obey the laws of Hooke and of Newton valid for the stationary state. Prior to its establishment, the irreversible process of viscous flow and the reversible elastic restoration processes cannot be sep'd. Although this relaxation period is very short for either "truly viscous" or "truly elastic" substances, it can be very long in high polymers. On very rapid deformation, termed "freezing nonequilibrium," even a viscous substance will behave like an elastic one and follow Hooke's law. In the stress relaxation of high polymers, orientation of the chains as a whole and that of its individual links do not as a rule coincide. The rate of the latter relaxation process within the chain is det'd. by the energy of interaction between chain links. Translation of the chains as a whole (flow), depending on the energy of interaction between chains, lags</p>		<p>behind the inner stress relaxation process. It only appears in its pure form once the stationary state is established and only then is it permissible to speak of viscous flow. Translational motion of chains can be hindered or suppressed by chain cross-linking as in vulcanization of rubber; the mobility of chain links remaining free, deformation will result in pure elastic effects. Anisotropy of viscosity along and across the chain axis ("oriented fibers") can be of different origin; it can result either from stress relaxation or from viscous flow. The length of the relaxation process within the chain depends on the degree of interaction of its polar groups, specifically on the variability of that interaction with the mutual position of the groups. This variation is small in cellulose but can attain significant values in rubber, as is evidenced by the change of sp. gravity on deformation and by the Joule heat effect. Inasmuch as viscous flow depends to a high degree on their mutual position, the motion being particularly obstructed in the case of parallel disposition of the chains, it is an error to rely on fast deformation in order to obtain best mechanical properties of a high-polymer material. This can only lead to temporary improvement of mechanical strength, at the expense of elastic properties. By way of viscous flow, permanent enhanced viscosity can be imparted to a material in a chosen direction; at the same time, inasmuch as in this case the relaxation process within the chain will appear in pure form, the elastic qualities of the material will be improved.</p>		<p>2</p>	
<p>ASS-51A METALLURGICAL LITERATURE CLASSIFICATION</p>		<p>12000 SYMBOLS</p>		<p>12000 SYMBOLS</p>	
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A-1

Process of viscous flow in highly-polymeric materials. V. Kargin and G. Slonimski (*Acta Physicochim. U.R.S.S.*, 1941, 14, 329-338).—The relationships of viscous flow in plastic materials to the classical conceptions of the deformation of an elastic solid and the flow of a viscous liquid are discussed. In substances having long-chain mols., the first effect of a stress will be to produce a deformation of the individual mols., which is not equally distributed along the chain. Subsequently a relaxation process will equalise this deformation along the chain. At the same time a shift of the chain as a whole with respect to its neighbours may also occur, and the relative speeds of these processes will depend on the relative binding forces within a chain and between different chains, and on the mutual orientation of the chains.  
E. J. G.

COMMON ELEMENTS		COMMON ALLOYS		COMMON POLYMERS		COMMON COMPOUNDS		COMMON METALS		COMMON NON-METALS		COMMON GASES		COMMON LIQUIDS		COMMON SOLIDS		COMMON COMPOUNDS		COMMON METALS		COMMON NON-METALS		COMMON GASES		COMMON LIQUIDS		COMMON SOLIDS	
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KARGIN, V. A.

"The Extraordinary Physical Peculiarities of High Polymers," Acta. Phys., Vol. XIV, No. 6, 1941.

"The Difference of Quick Electrons in thin Films of Cellulose Ester," Acta. Phys. Vol. XIV, No. 5, 1941.



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CH

Diffraction of fast electrons in thin layers of cellulose ethers. V. A. Kargin and D. I. Lel'puns'kaya. *J. Phys. Chem.* (U. S. S. R.) 15, 1011-21(1941); cf. *C. A.* 34, 7599. -- On the basis of exptl. data on the electron diffraction produced by thin layers of cellulose and cellulose esters (triacetyl, trichloroacetyl, stearyl) and ethers (benzyl) as shown in 6 figures and tables it is concluded that cellulose and its derivs., as well as other high polymers such as rubber or gelatin, are in an amorphous state at normal temps. The chains of cellulose and its esters and ethers are deformed; the link relaxation period is small compared with the chain relaxation period. Only the intramol. dispersion produces an observable interference. Hydrated and native cellulose differ in their chain structures, consisting, resp., of cellulose with glucose residues in a single plane, and the same units placed perpendicular to each other. The identity periods for the triacetate of  $\alpha$ -cellulose and of its hydrolysis product at 150° are each  $d_1 = 3.77$ ,  $d_2 = 2.02$ ,  $d_3 = 1.13$  Å. The corresponding values for "cellulose hydrate" are:  $d_1 = 4.64$ ,  $d_2 = 2.03$ ,  $d_3 = 1.11$  Å. F. H. Rathmann

Lab Colloid Chem Moscow Phys Chem Inst in Karpov

ASB 51.4 METALLURGICAL LITERATURE CLASSIFICATION

Reversibility of solutions of cellulose nitrate, benzylcellulose, and gelatin. I. Dissolution and swelling of cellulose esters. II. A. Tager and V. A. Kargin (*J. Phys. Chem. Russ.*, 1941, 15, 1029-1035, 1039-1054).—I. The solubility of benzylcellulose (I) in PhMe at 25° increases with the amount of (I) used but the dissolved part of (I) forms less viscous solutions than the undissolved residue. Qualitatively, dissolution of (I) in PhMe and  $C_6H_6$ , and of gelatin in  $H_2O$ , appears to be reversible.

II. The heat of dissolution of cellulose nitrate (II) in  $COMe_2$  is 16-18 g. cal. per g., and of cellulose acetate (III) (50% of OAc) in  $COMe_2$  9-11 g. cal. per g., almost independent of dilution. The heat of sorption of  $COMe_2$  and of  $COMeEt$  from gasoline by (II) is  $\propto$  the amount sorbed. The heat of dissolution of cellulose octa-acetate (IV) in  $COMe_2$  and in  $CHCl_3$  is very different from that of (III); the difference is due probably to (IV) being cryst. and (III) liquid. Other properties of polymerides also indicate their liquid nature.

J. J. H.

A. C. S.

Geology

Highly purified aluminum silicate salts. M. R. SURSH-  
NIASHVILI AND V. A. KARGIN. *Zhur. Fiz. Khim.*, 15,  
1121-28 (1941); *Chem. Abstr.*, 36, 6063 (1942).--A very  
pure  $Al_2O_3 \cdot 4SiO_2$  was prepared and further purified by pro-  
longed dialysis and electrodialysis, first at 40 to 50 v./cm.  
(400 hr.) and finally at 800 v./cm. (50 hr.). The final sols  
obtained contained  $1.0 \times 10^{14}$  particles of 30 m $\mu$  diameter  
per liter; the specific electrical conductivity was  $1.3 \times$   
 $10^{-6}$  mho. The particles do not migrate in an electrical  
field. These results indicate that the charge of soil  
particles is not due to silicates of aluminum.

KARGIN, V. A.; TOLSTAYA, M. A.

"Exchange Adsorption on Sols of Silver Iodide", Zhur. Fiz. Khim. 16, Nos. 3-4, 1942.  
Moscow, Physico-Chemical Institute imeni L. Ya Karpov, Laboratory of Colloidal Chemistry. Received 26 April 1941.

Report U-1523, 24 Oct. 1951.

1ST AND 2ND COLUMNS										3RD AND 4TH COLUMNS									
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STRUCTURAL PROCESSES IN THE FLOW OF HIGH POLYMERS.																			
V. A. Kargin. <i>Trudy Konferentsii Vysokomolekulyar. Simpozium, Abstr. Nefti S.S.S.R., Otdel. Khim. Nefti i Otdel. Fiz.-Mat. Nauk</i> 1, 10 (1943) (Pub. 1948); <i>C.A.</i> 27, 1639. —The distinction between reversible elastic deformation and irreversible plastic flow in high polymers is pointed out. The latter process changes the relation of various parts of the polymer to one another, and if the polymer contains many different groups, as do proteins, it may greatly modify the orientation and properties of the polymer chains.																			
H. M. Leicester																			
ASAC-55A METALLURGICAL LITERATURE CLASSIFICATION										B-270000, 270000									
1940-1949										1950-1959									
1960-1969										1970-1979									
1980-1989										1990-1999									

LIST AND TWO COLUMNS																										PRECEDENTS AND PRESENTS INDEX																									
<p><i>Ca</i></p> <p>Investigation of the structure and properties of ether cellulose ester films. II. Change in structure of nitrocellulose films on relaxation. V. A. Kargin, P. V. Kozlov and R. V. Zueva. <i>J. Phys. Chem.</i> (U. S. S. R.) 17, 318, 25(1943); cf. <i>C. A.</i> 35, 5043<sup>9</sup> - The use of the x-ray method for the study of film structure and the detn. of the double refraction of the films enabled the authors to investigate the cycle of structural changes that take place when nitrocellulose films are subjected to rapid deformations. It was found that when the load was released from a stretched nitrocellulose film the latter underwent a two-stage relaxation process, the first marked by a sharp decrease in the double refraction and the vanishing of x-ray texture structure. After heating the film to 100 °C, the life of this first period is measured in minutes only. The second period of relaxation proceeds so slowly that the film seems to be stable and optically anisotropic. In the case of the benzyl celluloses the relaxation proceeds more rapidly, the first period is a matter of seconds only, the second period goes to the end and leads finally to an isotropic film.</p> <p>F. H. Rathmann</p>																																																			
ASB-35A METALLURGICAL LITERATURE CLASSIFICATION																										E-2																									
<p>SEARCHED INDEXED</p> <p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26</p>																										<p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26</p>																									

CA 2

137 AND 140 ORDER

PROCESSED AND PROPERTIES INDEX

The relation of the physical properties of solutions of compounds of high molecular weight to temperature. V. A. Kargin (L. Ya. Karpov Physico-Chemical Inst.). *Trudy Konferentsii Vysokomolekululyar. Soedineniyam, Akad. Nauk S.S.S.R., Otdel. Khim. Nauk i Otdel. Fiz.-Mat. Nauk* 2, 60-5(1944)(Pub. 1945).—When polymers are cooled, they show loss of viscous flow (intermol. shifts) and of elasticity (intramol. shifts). If the polymer contains polar groups that react with one another, viscous flow may be lost before elasticity. These effects are more noticeable in solns. than in the pure polymers. Gel formation corresponds to loss of viscous flow. The temp. of gel formation in gelatin and other protein solns. can be raised by adding quinone to the solns. to form more intermol. bonds. Gels show about the same deformation at all rates and there is little dependence on temp., whereas the reverse is true for soln. Thus it is possible to det. the state of a polymer soln. by measuring the phys. properties. It is thus shown that nitrocellulose contg. EtOH exists as a gel, whereas nitrocellulose and butyl phthalate form a soln. The same effect is noted with pure polyisobutylene that exists in a state corresponding to a soln. Addn. of 5-6% Cl converts it to a gel-like state. H. M. L.

ASTM-31A METALLURGICAL LITERATURE CLASSIFICATION

FROM MONITOR

RELIANT Gel Only 181

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RECORD NO. 97

RECORD NO. 98

RECORD NO. 99

RECORD NO. 100

KARGIN, J. A.

"Effect of Temperature on the Physico-Chemical Properties of Linear Polymers,"  
a report presented at the June session of the Dept. of Chem. Sci., AS USSR held  
28-29 June 1946.

Vestnik AS USSR 8/9, 1946



1ST AND 2ND ORDER		PROCESS AND PROPERTIES INDEX		1ST AND 2ND ORDER	
<p><b>Mechanical deformations occurring in films during their preparation from solutions.</b> V. A. Kargin and M. N. Shitling. <i>J. Phys. Chem.</i> (U.S.S.R.) <b>20</b>, 727-41 (1946). Solns. of cellulose acetate (I) and cellulose nitrate (II) were smeared on strips of a fabric, 5 cm. X 30 cm., kept under tension by a 250-g. load. As the solvent evapd., the films contracted, and the final relative contraction <math>\alpha</math> % was detd. The value of <math>\alpha</math> was independent of the d. of the film at the moment when the final contraction was achieved. At this moment the film still contained some solvent, and d. apparently depended on its concn. When the solvent was driven off in a vacuum at 60°, then d. detd. in kerosene was independent of the compn. of the solvent. I contg. 55.6-55.8% of AcOH had d. 1.3122-1.3131, and II contg. 11.50-11.07% of N had d. 1.5085-1.5091. For a const. concn. of I in the original soln., <math>\alpha</math> was greater, the higher was the viscosity of the I used. <math>\alpha</math> increased also with the concn. of the original soln.; e.g., an 8% soln. gave <math>\alpha = 1.10\%</math>, and a 12% soln. gave <math>\alpha = 1.30\%</math>. The standard solvent (III) was acetone 50, ethanol 15, ethyl acetate 35%. Addn. of coagulants to III increased <math>\alpha</math>. Mixts. of 50 g. of 10% soln. of I in III + 10 cc. of addn. had <math>\alpha = 0.53\%</math> (addn. of III), 0.58% (addn. of dichloroethane), 0.63% (C<sub>4</sub>H<sub>6</sub>), 1.00% (amyl acetate), 1.14% (CCl<sub>4</sub>), 1.90% (H<sub>2</sub>O), and 2.20% (ethylene glycol dimethyl ether). The vol. of these coagulants required to cause turbidity in 20 g. of a soln. of I in III was, in the above order, <math>\alpha = 24, 10, 11, 8.0</math>, and 8.7. The greater the coagulating effect, the greater is <math>\alpha</math>. <math>\alpha</math> increases when the addn. of ethylene glycol dimethyl ether increases, e.g., from 1.1% at 5% to 3.0% at 30%. The value of <math>\alpha</math> is detd. by the rate of evapn. of the solvent and the rate of the increase of the viscosity <math>\eta</math> of the film. If <math>c</math> is the concn. of I in the film, then <math>\alpha</math> is greater the greater <math>d\eta/dc</math>. When <math>d\eta/dc</math> is large, <math>\eta</math> soon becomes so large that stresses in the film are proportional to the vol. of the solvent that has evapd., and these stresses cause contraction. The effect can qualitatively be described by Maxwell's relaxation equation, although actual films are more complicated in that they are not uniform.</p> <p style="text-align: right;">J. J. Bikerman</p>					
<p>AS P. 52. A METALLURGICAL LITERATURE CLASSIFICATION</p>					
<p>1ST AND 2ND ORDER</p>					

KARGIN, V.

USSR/Chemistry - Silicic acid, Gelation of  
Chemistry - Electrochemistry

Jul/Aug 1946

"The Electrochemical Properties of Highly Purified Ferrialuminosilica Gels and Sols,"  
M. Shishniashvili, Chem Inst, Acad Sci Georgian SSR, Tibilisi; V. Kargin, Karpov Inst  
Phys Chem, Moscow, 18 pp

"Acta Physicochimica URSS" Vol XXI, No 4

Study of highly purified mixed gels of silicic acid and sesquioxides. There are no  
electric charges on gel particles, indicating that gels contain no ionizable groups.  
Concludes that pure aluminosilica gels are not electrolytes. Received 4 May 1945.

PA 52T4

KARGIN, V. A.

"The Action of Electrolytes on Highly-Purified Ferrialuminosilica Gels,"  
Acta Physicochimica, Vol. 21, No. 5, 1946.

ca

Hydrocellulose fibers. V. A. Kargin, N. V. Mikhailov, I. M. Lepelskii, and I. D. Pliurov. U.S.S.R. 69,292, Sept. 30, 1947. Cotton cellulose is extd., and the resulting triacetate is spun. The spun fibers are then completely saponified, while at the same time subjected to stretch. M. Hosh

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

KARGIN, S. I.

Nitrogen Oxides

A reply to A.M. Murzin's article: "Optimum concentration of oxygen in the process of oxidation of nitrous gases." Zhur. prikl. khim. 20, No. 5, 1947.

SO: Monthly List of Russian Accessions, Library of Congress, June 1953, Uncl.

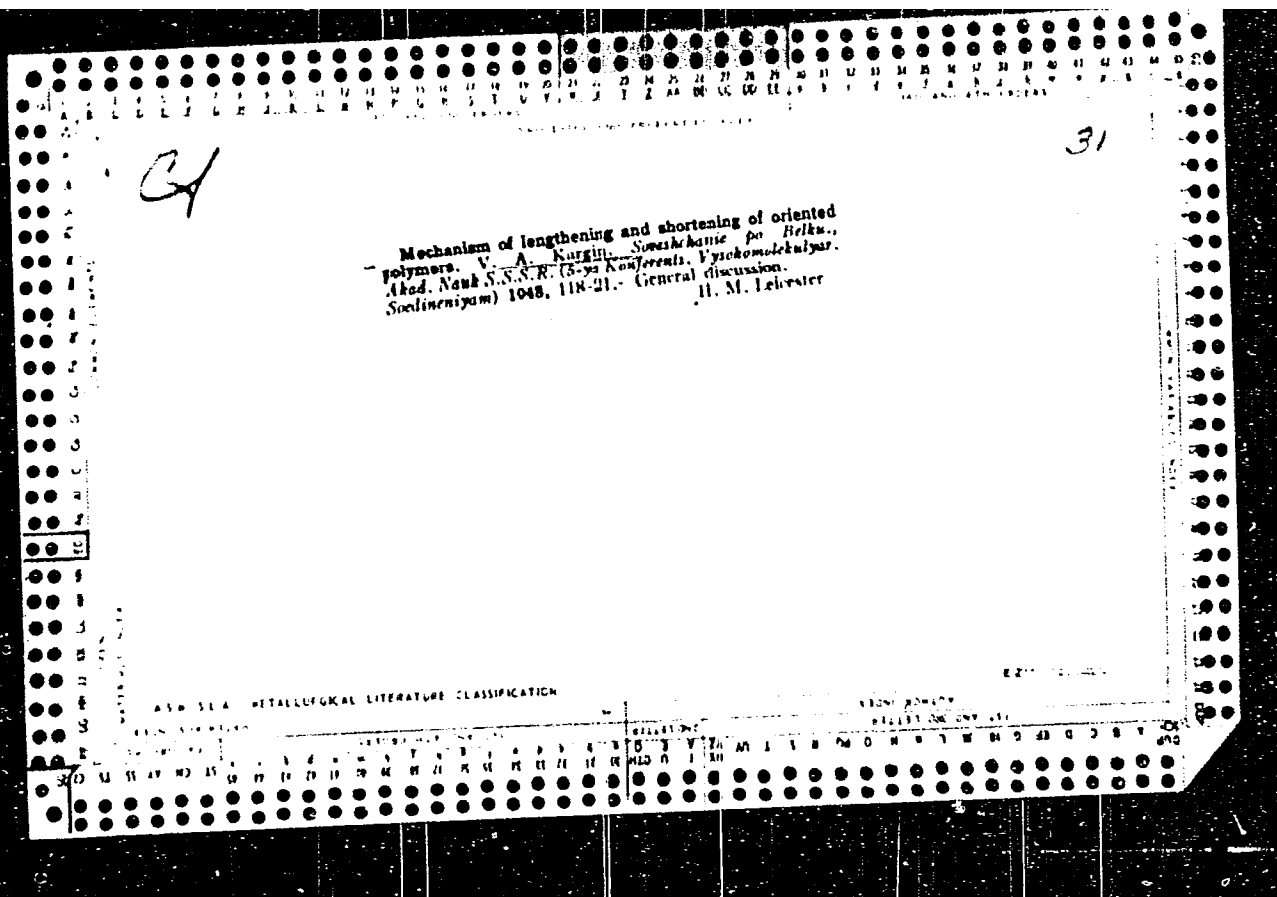
1ST AND 2ND ORDERS																										3RD AND 4TH ORDERS																									
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A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
<p>Preparation of basic salts of aluminum and investigation of their properties. M. K. Shishimashvili, V. A. Kargina, and A. L. Batsanadze (Acad. Sci. Georgian S.S.R., Tbilisi). <i>J. Phys. Chem.</i> (U.S.S.R.) 21, 361 (1947) (in Russian).—Five salts of the cation <math>Al_2(OH)_6^{4+}</math> were prepd. <math>Al_2O_3 \cdot HCl</math> (a glasslike mass) was made by dropwise addn. of 10% <math>NH_3</math> to 20% <math>AlCl_3</math> in <math>H_2O</math> at 80° to opalescence, leaving for 24 hrs., filtration, addn. of <math>(NH_4)_2SO_4</math> (0.05% of the required amt.), warming the ppt. of <math>(Al_2O_3)_2H_2SO_4</math> with <math>H_2O</math> (80% of the theory), filtration from <math>H_2SO_4</math>, and evapn. Other salts were prepd. by double decompn. They contain up to 11% of <math>H_2O</math> by double decompn. The mobility of <math>Al_2(OH)_6^{4+}</math> at 25° and infinite diln. is 0.13. From this value and the elec. cond. of satd. solns. the following solubilities are calcd.: <math>(Al_2O_3)_2H_2SO_4</math>, <math>8.6 \times 10^{-4}</math> g.-equiv./l.; <math>(Al_2O_3)_2H_2PO_4</math>, <math>7.00 \times 10^{-4}</math> g.; <math>(Al_2O_3)_2H_2HPO_4</math>, <math>0.08 \times 10^{-4}</math> g.; and <math>(Al_2O_3)_2H_2SiO_4</math>, <math>4.9 \times 10^{-4}</math> g. The soly. of <math>Al_2O_3 \cdot HCl</math> is about 180 g. in 100 g. <math>H_2O</math>. Hydrolysis of <math>Al_2O_3 \cdot HCl</math> in 0.1 N <math>HCl</math> at 25° takes many days. The salt can be titrated with alkali. Adsorption and electrochem. properties of <math>Al_2O_3</math> solvate deriv. by those of <math>Al_2O_3</math> salts are present in these solts.</p>																																																			
<p>ADD. SER. METALLURGICAL LITERATURE CLASSIFICATION</p>																																																			

ARBUZOV, B.A., redaktor; DOLGOPLOSK, B.A., redaktor; KARGIN, V.A., redaktor;  
MEDVEDEV, S.S., otvetstvennyy redaktor; RAFIKOV, S.R., redaktor;  
ROGOVIN, Z.A., redaktor; VASKEVICH, D.H., redaktor izdatel'stva;  
SIMKINA, Ye.N., tekhnicheskii redaktor

[Proceedings of the third conference on high molecular weight  
compounds; polymerization and polycondensation] Trudy tret'sei  
konferentsii po vysokomolekulyarnym soedineniyam; polimerizatsiya  
i polikondensatsiya. Moskva, Izd-vo Akademii nauk SSSR, 1948.  
177 p. (MLRA 10:1)

1. Konferentsiya po vysokomolekulyarnym soedineniyam. 3d, Moscow,  
1945.

(Polymerization) (Condensation products (Chemistry))





PROCESSES AND PROPERTIES INDEX

30

*C*

The mechanism of swelling of rubberlike high-molecular substances. High-molecular isoparaffins and isooctane. A. Tager and V. A. Kargin. *Kolloid. Zhur.* 10, 455-462(1948).—The behavior of a polymer dissolved in its hydrogenated monomer (in this system the forces between various segments of the polymer mol. are very similar to the forces between these segments and the solvent mol.) was studied by the effect of Oppanol (I) and Vistanex (II) on the vapor pressure of 2,2,4-trimethylpentane (III). Samples of I and II were suspended on spring balances in III vapor, and the amt.  $x/m$  (g./g.) of III taken up by the adsorbent was detd. at various equil. vapor pressures  $p$  at 65°. The relative vapor pressure  $p/p_0$  varied between 0.11 and 0.60 and  $x/m$  between 0.013 and 0.18. If Raoult's law were valid for these concd. mixts., the mol. wts.  $M$  of I and II would be roughly equal and  $\approx 1000$ . The viscometric  $M$  of I was 251,000, and of II 191,000. In concd. soln. a chain of 10-12 links is the kinetic unit of I and II; in dil. solns. the whole mol. is this unit. When viscometric  $M$  values are used for calcg. the entropy  $S$  of mixing, the calcd.  $S$  is about 0.01 the exptl.  $S$ , because the presence of solvent greatly increases the no. of possible configurations of the polymer mol. J. J. B.

Physics Chem. Inst. im. L. Ya Kargin, Lab of Colloid Chem.

ASH-SLA METALLURGICAL LITERATURE CLASSIFICATION

KARGIN, V. A.

"The Structure of  $V_2O_5$  Ashes," Dok. Akad. Nauk, Vol. 59, No. 6, 1948.

"Research on the Process of Viscous Flow in Polyisobutylene," in collaboration with T. I. Sogolova, in Zhurnal Fizicheskoi Khimii, Vol. XXIII, No. 6, 1948

"Physical Chemistry of High-polymer Substances," Zhur. Fiz. Khim., 1948-49.

PA 36/49R9

KARGIN, V. A.

USSR/Chemistry - Polymers, Linear  
Mathematics - Applied

Sep 48

"Deformation of Amorphous Liquid Linear Polymers,"  
V. A. Kargin, Corr Mem, Acad Sci USSR, G. L.  
Slonimskiy, Physicochem Inst imeni L. Ya. Karpov,  
4 pp

"Dok Ak Nauk SSSR" Vol LXII, No 2

Theoretical mathematical treatment of the deformation of amorphous liquid linear polymers. Proposes and discusses model. Submitted 10 Jul 48.

36/49T9

Kargin, V. A.

Structure and thermodynamic stability of highly oriented cellulose hydrate fibers. N. V. Mikhailov, V. A. Kargin, and V. I. Runko. *Izvestiya Akad. Nauk SSSR Khim. Tsellyuloz. Papern.*, 1969, 231-8. A structural study, with application of x-rays, was made on cellulose hydrate fibers in the elongation interval of 0-200%. In comparison with natural cellulose, the hydrated form was more oriented in spite of a decrease of 80% in tensile strength. A hydrated fiber stretched by 180% in NaOH soln. showed no new interference spots on x-ray examn. Hence the sharp, almost pointlike interference spots which appeared in the diagrams of highly oriented cellulose hydrate specimens were not the result of a phase transformation into a crystal state but were simply the result of a structure which was nearly stable and had a long period of relaxation. Treatment of the hydrate fiber in glycerol 8 hrs. at 250° gave a product whose x-ray diagram resembled that of natural cellulose with a high degree of orientation; treatment of this with 16% NaOH to revert the substance to the cellulose hydrate form reverted completely to the original pattern. Thus this cycle could be repeated at will. The results support the contention that natural cellulose differs from the hydrate in the configuration and disposition of chain linkages, each of which has its own equl. form of the chain. The effect is based on the fact that chain expansion or contraction can occur more readily than chain displacement or transformation. O. M. K.

Kirgin, V. A.

1. Relaxation phenomena in the formation of cellulose by-  
 drate fibers. V. A. Kirgin, N. V. Mikhailov, and V. I.  
 Bilin. *Izvestiya Akad. Nauk SSSR, Seriya Khim.*  
 1949, No. 10, 2105-2110. The mech. strength dia-  
 grams were obtained for viscose fibers with dehydrat-  
 ion under known loads in time. Relaxation phenomena  
 are regarded as the results of stress distribution through the  
 mol. chains with a certain degree of resultant deformation  
 and increase of rigidity. Thus polymers with rigid chains  
 initially exhibit such a great rise of internal rigidity under  
 stress that deformation may cease, similar to what occurs in  
 the transition to the vitreous state. Mech. vitrification is  
 thus produced in the viscose fiber under a load of sufficient  
 magnitude. The kinetics of the vitrification is simply re-  
 lated to relaxation change: there is a linear relation of re-  
 laxation ability to the logarithm of the time of vitrification.  
 The vitrified fibers can be relaxed after heating in an aqueous  
 medium; this leads to losses in tensile strength and an in-  
 crease of limiting elongation. O. M. Kozlov

1ST AND 2ND ORDERS																										1ST AND 2ND ORDERS																									
PROCESSES AND PROPERTIES INDEX																										PROCESSES AND PROPERTIES INDEX																									
<p><b>Problem of the Three Physical States of Amorphous-Liquid Linear Polymers.</b> (In Russian.) V. A. Kargin and T. I. Sogolova. <i>Zhurnal Fizicheskoi Khimii</i> (Journal of Physical Chemistry), v. 23, May 1949, p. 530-539.</p> <p>Deformation of polyisobutylene of different molecular weights, from <math>-80</math> to <math>200^{\circ}\text{C}</math>, and in all three states was investigated. These states are vitreous, highly elastic, and viscous. Shows that temperature of vitrification is independent of molecular weight, but that the temperature of the viscous state increases with increase of molecular weight. A formula is proposed relating the temperature range of the highly elastic state to molecular weight, including degree of polymerization as a variable. This formula enables calculation of molecular weight on the basis of mechanical characteristics determined over a wide temperature range.</p>																																																			
<p>ASB-51A METALLURGICAL LITERATURE CLASSIFICATION</p>																																																			

**B**

**Development of a Method of Studying the Actual Process of Flow in Polymers.** (In Russian.) V. A. Kar-  
gin and T. I. Sogolova. Zhurnal Fizicheskoi Khimii  
(Journal of Physical Chemistry), v. 23, May 1949,  
p. 540-550.

On the basis of a method developed for determi-  
nation of deformation under tensile stress of poly-  
isobutylenes of different molecular weights at  
different temperatures and times of application of  
stress, the mechanism of true flow of polymers  
may be established. A formula for calculation of  
the coefficient of viscosity on the basis of experi-  
mental data is proposed.

ASH-SLA METALLURGICAL LITERATURE CLASSIFICATION

SECTION NUMBER

73181 QM QMA 161

PROCESSING AND PROPERTIES INDEX

2

CA

No. 5

Study of viscous flow of polyisobutyrene. V. A. Kargin  
and T. I. Bogolova. *Zhur. Fiz. Khim.* 23, 651-62(1947);  
cf. preceding abstr.—The quantity  $\eta_0$  is independent of  $t$ ,  
of  $t$  (varied, e.g., from 7 to 27 hrs.), and of  $l_0$  (1–3 cm.).  
At 15°,  $\eta_0 \times 10^{-10}$  is 2.0, 1.5, and 0.8 for  $M = 5.3 \times 10^4$ ,  
 $3.5 \times 10^4$ , and  $1.0 \times 10^4$ , and at 60° it is 0.019, 0.0012,  
and 0.0012, resp.  $Af$  can be calcd. from  $\eta_0$ . The  $l$  achieved  
by extending the ribbon almost to rupture is greater the  
higher the temp. (15–60°), but  $l - l_0$  depends little on  
temp. The quantity  $\eta_0 h/l_0$  corresponds to the usual vis-  
cosity. It increases with extension. This is a condition  
for filament formation. The increase of  $\eta_0 h/l_0$  is due to  
straightening of the polymer chains which reduces the rate  
of diffusion.  
J. J. Bikerman

ASD-ILA METALLURGICAL LITERATURE CLASSIFICATION

ASD-ILA



**B**

**Determination of Molecular Weight of Linear Polymers on the Basis of Their Mechanical Properties.** (In Russian.) V. A. Kargin and G. L. Slonimskii. *Zhurnal Fizicheskoi Khimii* (Journal of Physical Chemistry), v. 23, May 1949, p. 563-571.

The three physical states of polymers (vitreous, highly elastic, and viscous) were investigated theoretically. A formula relating the temperature range of existence of high elasticity to molecular weight is derived. Comparison of theoretical with experimental results confirms basic conclusions.

ASAC SLA METALLURGICAL LITERATURE CLASSIFICATION

187000-417 ONV GSE

RELATION:

187000-417 ONV GSE

114 R 41 N V. A.

4

Determination of the phase state of high polymers.  
V. L. Kargin and V. A. Kargin (Kargin Inst. Chem.  
Chem., Moscow). *Zhur. Eksp. Fiz.* 23: 102-7 (1944).  
The breadth  $\Delta$  of a beam diffracted by a crystal lattice is  
proportional to  $\lambda \sec \theta$ ;  $\lambda$  is the wavelength of the radia-  
tion used and  $\theta$  is the Bragg angle. K. and K. propose  
to call "cryst." those systems only for which this relation  
holds. The two  $\lambda$  used were 1.54 Å (K $\alpha$  line of Cu)  
and 0.06 Å (an electron beam). The relation was con-  
firmed on 2 samples of colloidal Au; their particle size  
calcd. from  $\Delta$  was 118-140 Å (x-ray) and 105-160 Å  
(electron diffraction), whereas an electron microscope  
gave 180 Å. The relation was not confirmed on polymers  
of CH<sub>3</sub>CHOH, PhCH=CH<sub>2</sub>, and CH<sub>2</sub>=CHCl and on  
polybutadiene. In all these instances  $\Delta$  of the electron  
beam was several times that calcd. Hence, these poly-  
mers are not cryst. Polyethylene gave very sharp lines at  
both  $\lambda$  and must contain oriented patches of considerable  
size (over  $10^{-8}$  cm.). J. J. Eklerman

KARGIN, V. A.

58/49T32

USSR/Chemistry - Isobutylene  
Chemistry - Viscometric Analysis

May 49

"Research on the Process of Viscous Flow in  
Polyisobutylene," V. A. Kargin, T. I. Sogolova,  
Physicochem Inst Imeni L. Ya. Karpov, Lab of  
Colloid Chem, Moscow, 12 pp

"Zhur Fiz Khim" Vol XXIII, No 5

Concludes increase in viscosity during flow is  
explained by a straightening out of the chains of  
high polymers which causes a decreased rate of  
diffusion and a consequent transposition of the  
chain. This hypothesis is in conformity with

58/49T32

USSR/Chemistry - Isobutylene (Contd) May 49

relaxation properties of polyisobutylene sub-  
jected to flow. Submitted 10 Jul 48.

58/49T32

BP

AD-10

Misc. Unclassifiable  
Substances

Structure of gels. Preparation of globular gelatin. Z. N. Zhurkina and V. A. Kargin (C. R. Acad. Sci. URSS, 1949, 87, 639-641).—Dilute solutions of gelatin are evaporated to dryness at 5° in vacuum. The product differs from ordinary gelatin in being sol in cold H<sub>2</sub>O, without giving gels; formation of small globular aggregates, rather than of linear polymers, is hence postulated. These aggregates break down at about 30°, unless stabilised by tanning with quinine. No. 4,  
R. Tauscek.

C.A.

23

Changes in physical-mechanical properties of cellulose fibers under the action of elevated temperatures. T. Finkelhteln, V. Kargin, and Z. Rogovin. *Tekstil. Prom* 10, No. 8, 9-11 (1950).--Heating hydrated cellulose fibers in a high vacuum for 2 hrs. at 200° did not affect the degree of polymerization and strength of fiber. At higher temps., dehydration and breakdown of the macromol. occurred as indicated by lowered mol. wt. and poorer mech. properties. Parallel studies of viscose and triacetate fibers have shown that the decrease in degree of polymerization upon heating to 200° is the same as that for cellulose. At 230-240° a sharp drop in mech. properties was experienced in all cases. Marshall Sittig

CA

31

Influence of the molecular weight on the transition temperatures of polyvinyl chloride. V. A. Kargin and Yu. M. Malinskii. *Doklady Akad. Nauk S.S.S.R.* 72, 725-8(1950).—The relative deformation produced by a load of 0.42 kg./sq. cm. in 10 sec. was detd., as a function of the temp., for 12 samples of different degrees of polymerization  $n$ , the mol. wts. ranging from 1250 to 71,900. At lower mol. wts., the vitrification temp.  $t_g$  increases rapidly with  $n$ , and the temp. of beginning flow  $t_f$  lies only 6-8° above the temp. of beginning softening. This gap becomes increasingly wider as  $n$  increases; the initial rapid increase of  $t_g$  ceases with further increasing  $n$ , whereas  $t_f$  continues to increase at about the same rate. The beginning divergence of  $t_g$  and  $t_f$  is considered as an indication that the mols. have reached the size of "segments," a segment being the min. length capable of bending. If a polymer mol. is of the size of a few segments, its deformability on heating is detd. no longer by a displacement of the mol. as a whole, but by relative displacement of segments within the mol. From the exptl. data, a "segment" in polyvinyl chloride is of the size of 90-90 monomer links, i.e., mols. smaller than that size are still relatively rigid.

N. Thon

C. A.

3

Influence of the volume concentration of plastifier on the vitrification temperature of the plastic. V. A. Kargin and Yu. M. Malinskii. *Doklady Akad. Nauk S.S.S.R.* 73: 967-70 (1950). --Vitrification temp.  $T_g$  of polychlorovinyl (mol. wt. 72,000), as a function of the amt. of plastifier incorporated, all lie on the same straight line for a series of different plastifiers (tributyrin, diethyl sebacate, dioctyl sebacate, dimethyl phthalate, dioctyl phthalate, cyclohexanone, chlorobenzene, heptyl heptylate) if the amt. of plastifier is expressed in vol. fractions  $\phi$ ; the lowering of  $T_g$  for all the plastifiers enumerated, is a linear function  $\Delta T_g = 193 \phi$ . Analogously, for polystyrene (mol. wt. 838,000), (plastifiers hexachloroethane, chlorobenzene, ethylbenzene, dimethylphthalate, dioctyl phthalate, *sec*-butylbenzene, methylhexyl ketone, cetyl chloride),  $\Delta T_g = 275 \phi$ , holding up to about  $\phi = 0.35$ ; deviations, in the direction of the exptl.  $T_g$ , lying above the straight line, appearing at higher  $\phi$ , especially with the phthalates, are attributed to their relatively high  $T_g$ . If the concn. of the plastifier is expressed in mol. %, the curves for the different plastifiers do not coincide. The linear relation between  $T_g$  and the vol. fraction of the plastifier, regardless of its nature, is proof that microviscosity in high polymers is detd. by the geometric factor of the mean distance between the macromols. N. Thon

CA

2

**Molecular uptake of silver salts by iron hydroxide** (1) I. Lomtzenko, V. A. Karagin, and A. A. Ryabinin. *Anal. Chem.* 18, 8 (1941) Gels obtained by hydrolyzing  $FeCl_3$  in  $H_2O$  were dialyzed and electrolyzed (the nature of the membrane is not stated) for months. The elec. resistance  $R$  of the gels increased during this treatment, e.g. from 8 (gel A) to 135 (gel B) and then remained almost const. (C);  $R$  of distd.  $H_2O$  was 70 in these units. These gels were titrated potentiometrically with 0.05  $N$   $AgNO_3$  and a  $Ag$  electrode, and the no.  $F$  of g.-equiv. of  $Ag$  taken up by 100 g. dry  $Fe_2O_3$  was calcd.  $F$  was, e.g., 13, 22, and 12 for A, B, and C, resp., when the equil. concn. of  $AgNO_3$  was 0.0005  $N$ . The uptake by A was due to  $Cl^-$  in it, the uptake and to true mol. adsorption, and the uptake by C was small because the sample was partly cryst. and the electrolytes were removed from the surface of the micelles. Gels prepd. by hydrolysis of  $Fe(NO_3)_3$  behaved similarly, and the uptake of  $Ag^+$  by fully dialyzed gels was equal to that by C; this showed that all  $Cl^-$  and  $NO_3^-$  were washed out. The uptake of  $Ag$  by aged gels from either  $FeCl_3$  or  $Fe(NO_3)_3$  decreased during dialysis (to stage B) but increased again to stage C. At stage C,  $F$  was about 15 for 0.002  $N$   $AgNO_3$ .

J. J. Bikerman

1951



CA

2

No. 4

Artificial weathering and synthesis of minerals during electrodialysis. O. I. Dmitrenko and V. A. Kargin. *Holod. Zhur.* 13, 259-66 (1951).—A method is given for studying reactions between 2 very dil. solns. without using large vols. A 3-chamber electrodialyzer is used. It is made up of anodic compartment|membrane|powd. mineral *A* in  $H_2O$ |membrane| $H_2O$ |membrane|powd. mineral *B* in  $H_2O$ |membrane|cathodic compartment. Cations

from *A* and anions from *B* meet in the central compartment and thus react in a small vol. of soln. When both *A* and *B* were beidellite ("gumbria" from Ural), a mineral similar to stellerite formed after 8 months in the central chamber; its mean  $n$  was 1.488. The anodic compartment contained calcite and unidentified needles. When *A* and *B* were phlogopite, the central chamber after 10 days contained apparently magnesian hornblende,  $n$  1.532, beidellite or potassiophyllite,  $n$  1.537, and saponite,  $n$  1.511. The pH of the cathodic liquid was 7.0 and of the anodic 3.5. This method presumably reproduces, in a shorter time, the hydrolysis of minerals in the earth's crust. Electrodialysis of beidellite in the conventional 3-chamber app. yielded calcite. Electrodialysis of  $Fe(OH)_3$  sol for 60 weeks gave goethite.

J. J. Bikerman

Inst. Geol. Sci., AS USSR, Dept. Sedimentary Petrography

KARGIN, V. A.

USSR/Chemistry - Suspensions, Carbon Black

Sep/Oct 51

"Investigation of Structures in Carbon Black Suspensions. 1. Effects of the Velocity of Flow, Time, Temperature, and Concentration of Carbon Black on the Structure of Carbon Black Suspensions, "S. S. Voyutskiy, A. D. Zayonchkovskiy, V. A. Kargin, S. I. Rubina, Cen Sci Res Inst of Leather Substitutes, Moscow

"Kolloid Zhur" Vol XIII, No 5, pp 333-333

Developed method for detg structure formation in carbon black, which is based on measurement of elec cond without destruction of structure. Demonstrated existence of elec cond in very dil carbon black suspensions both in static condition and in flow. Using new method, studied effect of flow velocity on structure and dependence of structure on time, temp, and concn. Demonstrated that carbon black particles have nearly constant diam throughout particle.

PA 196T4

2

CA

X-ray study of polyvinyl alcohol and polyvinyl chloride  
 N. A. Kargin and I. Ya Petrov (Karpov Inst. Phys.-Chem.,  
 Moscow). *Zhur. Fiz. Khim.*, **25**, 345-51 (1951).—Polyvinyl  
 alc. and polyvinyl chloride polymers were investigated in a  
 Laue camera between room temp. and 100° with various  
 amts. of plasticizer, with the idea that it is necessary to  
 compare structures below and above  $T_g$  (transition from  
 solid to high-elastic state) in order to det. the relative amt.  
 of cryst. and amorphous material in the polymer (cf. C.A.  
 37, 1639<sup>4</sup>). From the lack of change of the x-ray pattern  
 (spacing and intensities) below and above  $T_g$  for both poly-  
 mers, it is concluded that they are amorphous and that there  
 is no phase change at  $T_g$ . A similar conclusion is reached  
 from the effect of large quantities of plasticizer which solely  
 increase the uncoherent scattering for both oriented and  
 nonoriented films. Thus, there must be no intermol. scat-  
 tering but only intramol. scattering. Temp. and plasticizer  
 have no effect on the short-range configuration of the chains  
 or their relative positions. Michel Boudart

KARGIN, V.A.

178T13

USSR/Chemistry - Carbon Black

21 Jan 51

"Investigation of Structure Formation in Carbon Black Suspensions," S.S. Voyutskiy, A. D. Zayonchkovskiy, V.A. Kargin, Corr Mem, Acad Sci USSR, S.I. Rubina, CEN Sci Res Inst of Leather Substitutes

"Dok Ak Nauk SSSR" Vol LXXVI, No 3, 419-422

Subjected suspension of carbon black in oil to action of rotating cyl of electrically driven M.V. Volarovich PB-4 viscometer. Found elec cond of the suspension to be reduced perpendicularly to direction of flow and increased in direction of flow due to orientation. Cond increased with increasing temp by reason of formation of coagulation structures with increased contact surface between particles. Although greater at higher concn, cond is still quite prominent at low concn.

178T13

KARGIN, V. A. and USMANOV, Kh. U.

"Water Sorption and Structural Differences in Cellulosic Materials," Khim. i Fiz.Khim. Vysolomolekul. Soyedinenii, Dok. 7-oi Konf. po Vysokomolekul. Soyedineniyam, pp. 169-181, 1952

Translation D 449977

KARGIN, V. A.

Rubber Abstracts  
March 1954  
Synthetic Rubber  
and Like Products

1093. Influence of plasticizers on the hardening temperature of polystyrene and polyvinyl alcohol. 2  
V. A. KARGIN and V. M. MALINSKII. *Khim. i. Fiz. Khim. Vysokomolekul. Soedinenii, Doklady 7-oi Konf. Vysokomolekul. Soedinenii*, 1952, 255-54; *Chem. Abs.*, 1953, 47, 12878. The temperature interval of hardening in a polymer-plasticizer mixture was found to be proportional to the volume of the plasticizer, regardless of the latter's nature. Zhurkov's theory (the hardening temperature of a polymer depends on the molar concentration of the groups active in a plasticizer) was found to apply only in the case of strongly polar polymers. 3554288

10-11-51  
mf

(CA 47 no. 22:12878 '53)

- KLIMENKOV, V.S.; KARGIN, V.A.; KITAYGORODSKIY, A.I.

Density of packing of highly polymeric compounds. Khim. i Fiz.  
Khim. Vysokomolekul. Soedineniy, Doklady 7-oy Konf. Vysokomolekul.  
Soedineniyam '52, 231-41. (MLRA 5:7)  
(CA 47 no.15:7817 '53)

MIKHAYLOV, N.V.; MAYBORODA, V.I.; KARGIN, V.A.; MIRONOVA, Ye.A.; BALANDINA, I.N.

New data on the kinetics of the ripening of viscose. Colloid.J. (U.S.S.R.)  
14, 61-9 '52 [in English].  
(CA 47 no.19:10221 '53)



KARGIN, V. A.

USSR/Chemistry (Colloid) - Vanadium Pentoxide

Mar/Apr 52

"The Structure of Vanadium Pentoxide Solubles," Z. Ya. Berestnyeva, T. A. Koretskaya, V. A. Kargin, Sci Res Phys Chem Inst imeni L. Ya. Karpov

"Kolloid Zhur" Vol XIV, No 2, 1952, pp 73-76

Electron diffraction diagrams of freshly prepd  $V_2O_5$  sols and of sols prepd by aging were obtained. The freshly prepd sols have amorphous structure. As they age, crystn sets in. After a few days, good interference pictures of polycrystals are obtained.

216T8

KARGIN V

KARGIN, V. A.

Chemical Abst.

Vol. 48 No. 9

May 10, 1954

General and Physical Chemistry

Thermodynamic study of systems of polymers and hydro-  
genated monomers. A. Tagar and V. A. Kargin. *Colloid*  
J. (U.S.S.R.) 14, 395-9 (1952) (Engl. translation).—See  
C.A. 47, 14059.  
H. L. R.

(2)  
Chem

11-9-54

KARGIN, V. A.

Chem. Abst.

Vol 48, No. 9

May 10, 1954

General and Physical Chemistry

The mechanism of formation of colloidal particles of a  
gold sol. Z. Ya. Berestneva, T. A. Koretskaya, and V. A.  
Kargin. *Colloid J. (U.S.S.R.)* 14, 327-32 (1952) (Engl.  
translation).—See C.A. 47, 3083d. H. L. H.

Chem

8-31-54  
H.L.H.

Kargin, N.A.

1980. Mechanism of fatigue of vulcanized rub-  
ber. L. G. Stetsko, V. A. Kargin, G. N.  
Borisov, E. V. Baranov and M. I. Topolnik.  
Rubber Chem. Technol., 1981, p. 10-11. Poly-  
isoprene and non-saturated natural and butyl rub-  
bers were subjected for 288 h to severe shearing  
deformation. Fatigue lowers the molecular weight  
of polyisoprene causing destruction of struc-  
ture, changes the swellability of rubbers, their  
strength characteristics and the frequency depend-  
ence of the deformation. In the process of fatigue  
of rubber with uni-axial deformation there is an  
increase in the anisotropy of the mechanical prop-  
erties of the test-piece, connected basically with  
reversible relaxation phenomena. Fatigue is con-  
nected with the occurrence in the deformed polymer  
of free radicals, which set off chemical processes such  
as oxidation. As a result of the non-uniformity of  
the structure of the rubber these processes give rise  
to local microdefects, the growth of which brings  
about final destruction of the test-piece. There are  
15 references, and the discussion is reported.

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2 May

*Kargin V. A.*

The xanthation of cellulose. I. The reaction of carbon disulfide with sodium hydroxide. P. M. Cherkasskaya, A. B. Pakshver, and V. A. Kargin. *Faserforsch. u. Textiltech.* 4, 365-67 (1953). See *CA* 47, 5228e. II. The xanthation of simple carbohydrates and of cellulose. *Ibid.* 439-43. — To gain some information on the kinetics of the xanthation reaction a study is made of the xanthation of simple multivalent alcs. such as sucrose (I) and a degraded hydrate cellulose (II) with a degree of polymerization of 89, which is prepd. by acid hydrolysis of viscose rayon and is completely sol. in aq. alkali. The reactions are carried out in sealed tubes.

The reaction products are detd. potentiometrically according to Nefzakh and Stepanova, *Tekhn. Byull. Glavnoy Upravleniya Ispytaniy. Volokna* (1937)] and, from the curves obtained, the amt. of xanthate, sulfide, and trithiocarbonate is detd. directly. With II, the degree of xanthation is detd. iodometrically and converted into the  $\gamma$ -no. (the no. of  $\text{NaCS}_2\text{O}$  groups/100 glucose groups). The potentiometric and iodometric methods give values that agree well. The reaction of I with  $\text{CS}_2$  in alk. soln. is studied by detg. the dependency on time and temp. of the reaction products on xanthation, the influence of the ratio of I:  $\text{CS}_2$ :  $\text{NaOH}$  on the velocity of the xanthation of I with ratios of 1:1:5, 1:4:4, and 1:12:12 at 20 and 40°, the effect of the  $\text{NaOH}$  concn. on the velocity of the formation of the I xanthate, of  $\text{Na}_2\text{S}$ , and of  $\text{Na}_2\text{CS}_3$  at 40°, and by detg. the kinetic data of the xanthation of I at 20, 30, and 40°. The results, given in tables, indicate that the xanthation occurs according to the equation:  $\text{ROH} + \text{NaOH} \rightarrow \text{ROH} \cdot \text{NaOH}$  (III);  $\text{III} + \text{CS}_2 \rightarrow \text{ROCSSNa} + \text{H}_2\text{O}$ . The no. of reacted OH groups/glucose group is unknown. For low degrees of esterification the following equation is valid for the reaction velocity:  $w = k_1 \text{CS}_2$ . From the results of the xanthation of I and II,  $n$  (the no. of reacted OH groups) is found to be about 2. The xanthation of the high-mol. cellulose takes place under heterogeneous conditions and is therefore principally different. Because of diffusion of the  $\text{CS}_2$  in the surrounding medium or into the interior of the fiber the reaction is permutoid in character or else takes place on the surface. Since the reaction is carried out in sealed tubes it has a much more pronounced permutoid character and is, therefore, considered to be a pseudomonomol. reaction and the following equation is used for its kinetic calcs.:  $k_1 = 2.3/t \times \log 1/(1-x)$ , in which  $x$  is the amt. of combined  $\text{CS}_2$ . This equation gives satisfactory values up to a degree of esterification of about 18% ( $\gamma=50$ ).

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The results indicate that in the xanthation of cellulose and of simple sugars 2 independent reactions take place: the reaction of  $\text{CS}_2$  with the carbohydrate and with excess  $\text{NaOH}$ . In the 1st case the velocity of the formation of the xanthate passes through a max. because the equil. is continuously disturbed by side reactions. An increase in alkali concn. decreases the reaction velocity in the xanthation of I, either because  $\text{OH}$  groups are blocked by  $\text{NaOH}$  or because the equil. is shifted to the formation of  $\text{Na}_2\text{S}$  and  $\text{Na}_2\text{CS}_3$ . The xanthation of alkali cellulose in a heterogeneous medium can be expressed by an equation of the 1st order as a pseudo-unimol. reaction. Although the reaction should proceed more slowly because of the heterogeneous conditions the velocity, in this case, is somewhat greater than in a homogeneous reaction because, in the latter, there is a considerably larger excess of  $\text{NaOH}$  present. As compared with I, the process is much slower, particularly on the basis of equal amts. of reagents. By increasing the temp. the main reaction as well as the side reactions can be accelerated, and, in the case of I, the velocity of the main reaction is somewhat greater than that of the side reactions. The retarding effect of the alkali and of the heterogeneous course of the reaction are shown in a decrease in the temp. coeff.

F. B. Brauns

KARGIN V.A.

SHISHNIASHVILI, M.Ye.; KARGIN, V.A.

Silication and liming of red soils. Trudy Inst. khim. AN Gruz.SSR  
11:51-60 '53. (MIRA 10:2)

(Soils, Red) (Fertilizers and manures)  
(Lime)

KAROLY, V. A.

Reaction between carbon disulfide and sodium hydride.  
P. M. Cherkashin, A. B. Pakhver, and V. A. Karol'y.  
J. Appl. Chem. U.S.S.R. 26, 65-66 (1953) (Russian  
translation). See C.A. 47, 6228a.  
H. L. H.



KARGIN, V. A.

The xanthation of carbohydrates and cellulose. P. A. Cherkashina, A. B. Yakovlev, and V. A. Kargin. *Zhur. Prikl. Khim.*, 36, 311-320 (1963). The xanthation of sucrose (I) and an alkali-degraded hydrate cellulose (D. P. 63) (II) from viscose rayon in a homogeneous medium and of alkali cellulose (32.8% cellulose, 18.0% NaOH, and 81.2% H<sub>2</sub>O) (III) in a heterogeneous medium was studied. Xanthation was carried out in sealed tubes, and the products analyzed potentiometrically (C.A. 31, 1231) and iodometrically. The formation of I xanthate in moles/hr. is defined by  $A_1(C_1)^2$  up to a degree of xanthation (IV) of 12%, and of II xanthate by  $A_2(C_2)^2$  up to a IV of 16%. The xanthation of III up to 16% IV is considered as a pseudomonomolecular reaction,  $A_3 = 2.8/1 \log 1/(1 - a)$  where  $a$  = moles  $CS_2/C_{10}H_{16}O_5$  in the III xanthate, and  $t$  = time in hrs. In the xanthation of 0.575 moles I, the moles of bound  $CS_2$  for a ratio of I:CS<sub>2</sub>:NaOH (V) of 1:1:18 and at 40° were 0.31, 0.23, 0.24, and 0.16 for 1, 3, 6, and 9 hrs.; for a 1:14:4 V and at 50° the values were 0.51, 0.71, 0.92, 0.53, 0.36, and 0.22 for 18, 34, 48, 90, 130, and 168 hrs.; at 40°, 0.40, 0.78, 0.90, and 0.58 for 1, 3, 6, and 9 hrs.; for a 1:13:12 V and at 20°, 0.40, 0.34, 0.9, 1.03, 1.3, and 0.89 for 24, 48, 90, 120, 168, and 360 hrs.

and at 40°, 0.22, 0.48, 0.93, 1.34, and 0.52 for 1, 3, 6, 9, and 18 hrs. In the xanthation of 0.575 moles I (V = 1:1:12), the moles of I xanthate, NaCS<sub>2</sub>, Na<sub>2</sub>CS<sub>2</sub>, CS<sub>2</sub>, and NaOH at 20° were 0.09, 0.003, 0.0015, 0.482, and 1.007 for 3 hrs., 0.150, 0.006, 0.0030, 0.422, and 0.387 for 6 hrs., 0.210, 0.009, 0.0045, 0.364, and 0.610 for 9 hrs., 0.345, 0.012, 0.006, 0.323, and 0.571 for 12 hrs., and 0.393, 0.018, 0.009, 0.363, and 0.791 for 18 hrs.; at 30°, 0.083, 0.0023, 0.0003, 0.498, and 1.076 for 0.5 hr., 0.15, 0.0031, 0.0010, 0.481, and 1.002 for 1 hr., 0.24, 0.0104, 0.0021, 0.330, and 0.892 for 2 hrs., 0.273, 0.0188, 0.0033, 0.399, and 0.838 for 3 hrs., and 0.302, 0.0270, 0.0059, 0.240, and 0.700 for 4 hrs.; and at 40°, 0.135, 0.006, 0.0007, 0.446, and 1.118 for 0.5 hr., 0.230, 0.012, 0.0019, 0.447, and 0.690 for 0.50 hr., 0.323, 0.024, 0.0032, 0.344, and 0.747 for 1 hr., 0.350, 0.052, 0.0145, 0.183, and 0.599 for 2 hrs., and 0.350, 0.1275, 0.0315, 0.163, and 0.402 for 4 hrs. In the xanthation of 0.31 mole II, II:CS<sub>2</sub>:NaOH = 1:13:8, the moles II xanthate, NaCS<sub>2</sub>, Na<sub>2</sub>CS<sub>2</sub>, CS<sub>2</sub>, and NaOH at 10° were 0.056, 0.003, 0.001, 0.890, and 2.447 for 1 hr., 0.059, 0.010, 0.003, 0.850, and 2.398 for 2 hrs., 0.098, 0.015, 0.003, 0.808, and 2.347 for 3 hrs., 0.196, 0.030, 0.004, 0.783, and 2.300 for 4 hrs., and 0.166, 0.025, 0.003, 0.781, and 2.200 for 5 hrs.; at 20°, 0.040, 0.003, 0.001, 0.878, and 2.430 for 0.5 hr., 0.080, 0.012, 0.002, 0.868, and 2.380 for 1 hr., 0.115, 0.018, 0.003, 0.783, and 2.363 for 1.5 hrs., 0.143, 0.024, 0.004, 0.780, and 2.307 for 2 hrs., and 0.185, 0.038, 0.006, 0.591, and 2.163 for 3 hrs.; and at 35°, 0.020, 0.003, 0.0012, 0.877, and 2.431 for 0.25 hr., 0.10, 0.010, 0.0023, 0.818, and 2.328 for 0.8 hr., 0.143, 0.015, 0.0038, 0.771, and 2.300 for 0.78 hr., 0.175, 0.030, 0.005, 0.785, and 2.350 for 1 hr., and 0.310, 0.037, 0.010, 0.679,

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8.10 Cherkauskaya 2/2

and 2.143 for 2 hrs. In the xanthation of III (III:CS<sub>2</sub>:NaOH = 1.0:1.0:1.0), the moles CS<sub>2</sub>/C<sub>4</sub>H<sub>9</sub>O<sub>3</sub> were, for 30 and 40°, 0.058 and 0.144 for 0.25 hr., 0.115 and 0.233 for 0.5 hr., 0.168 and 0.333 for 0.75 hr., and for 20 and 30° 0.031 and 0.22 for 1 hr., 0.183 and 0.39 for 2 hrs., 0.287 and 0.51 for 2.0 hrs., and 0.460 and — for 3 hrs. In the xanthation of I (V = 1:1:2),  $k_{\text{ex}} \times 10^3 = 19.3, 62.3,$  and 591.0 for 20, 30, and 40°,  $k_{\text{ex}} \times 10^3 = 0.114, 0.49,$  and 2.03 for 20, 30, and 40°, and  $k_{\text{ex}} \times 10^3 = 0.076, 0.16,$  and 0.44 at 20, 30, and 40°. In the xanthation of II (II:CS<sub>2</sub>:NaOH = 1:8:8),  $k_{\text{ex}} \times 10^3 = 4.2, 11.0,$  and 27.1 for 15, 25, and 35°,  $k_{\text{ex}} \times 10^3 = 0.78, 1.52,$  and 3.22 for 15, 25, and 35°, and  $k_{\text{ex}} \times 10^3 = 0.36, 0.82,$  and 1.10 for 15, 25, and 35°. In the xanthation of III (III:CS<sub>2</sub>:NaOH = 1:1:1.5),  $k_{\text{ex}} \times 10^3 = 11.0, 24.5,$  and 54.3 for 20, 30, and 40°, and in the reaction of CS<sub>2</sub> with NaOH (1:2),  $k_{\text{ex}} \times 10^3 = 0.175, 0.52,$  and 1.05 for 20, 30, and 40°, and  $k_{\text{ex}} \times 10^3 = 0.094, 0.162,$  and 0.365 for 20, 30, and 40°.

John Lake Kenay

REF ID: A66111

125. Electron-diffraction studies of polymeric hydrocarbons. Polyethylene. E. E. RYLOV, V. I. KARPON, and V. A. KARGIN. *Zhur. Fiz. Khim.*, 1953, 29, 572-6; *Chem. Abstr.* 1954, 48, 7385. The electron diffraction analysis of unstretched polyethylene film prepared by film casting of a 0.5% solution in ligroine on water at 80° to 85°, gave an orthorhombic unit cell, with only certain of the diffraction rings showing slight orientation effects. The unit cell for the stretched polyethylene is also orthorhombic with slightly different dimensions, the pattern in this case showing layer lines of diffraction spots and arcs, some of the arcs being symmetrical and some unsymmetrical with respect to the layer line spots. On stretching, polyethylene crystals align themselves with their c-axes in the direction of stretch, and a and b axes in random directions. This produces the layer-line spots. The arcs are due to the alignment of 011 planes perpendicular to the direction of stretch; crystallites of this type are not too well orientated and give the diffraction arcs based on the unit cell of unstretched polyethylene.

352D34.34512

Mechanical properties of crystalline polymers. II. The polyethylenes. V. A. Kargin and T. I. Sokolova (L. Ya. Kargin, *Phys. Chem.*, Moscow, 244, 111, 1960; *Eng. Trans.*, 1960, 27, 1002-101003), *J. Appl. Phys.*, 32, 11, 1961.

The curve of tensile strength vs. elongation is that which is characteristic for crystal polymers. It consists of 2 straight-line segments. The properties of polyethylene upon stretching change discontinuously with a simultaneous abrupt change in the orientation. These changes occur only at a given tension and they do not occur throughout the entire sample but in a small portion of it (a collar) which during the stretching encompasses the entire mass of the sample. The study of the change in the mechanical properties of polyethylene over a broad temp. range shows that at tensions below the crit. tension ( $\approx$  lower than the tension required to form the collar) its deformation does not exceed 100%. At tensions equal to the crit. value (equal to the recryst. tension) the deformation can be 300%. Therefore, for a small change in pressure, upon attaining the recryst. tension, there is a significant increase in the deformation of the sample at a const. pressure. This is a specific characteristic of crystal polymers. At temp. 20° the deformation mechanism of polyethylene is the same as that of the polyamides. The process of converting the isotropic polyethylene into the anisotropic form

by stretching takes place through an intermediate phase transition from a disordered to an ordered orientation of the crystals by a rearrangement of the crystal lattice. At 50-60° the polyethylene is in the amorphous phase, and upon applying external force, the sample is deformed as a whole. At first the amorphous phase is oriented, and then the reorientation of the crystal phase occurs. The conclusion is drawn that the recrystallization can be a characteristic of the stability of the polymer crystal lattice. The data obtained show that the mech. properties and the mol. structure of polyethylenes depend upon temp. III. Copolymers of chlorovinyl with chlorovinylidene and gutta-percha. *Ibid.*, 1918-19.—The copolymers and gutta-percha follow the same law previously observed. Recryst. occurs in all of these crystal polymers upon the application of an external force. This transition occurs discontinuously and 2 parts appear in the sample, each having its own mech. properties. Each crystal polymer has a fixed temp. below which the breakdown of the sample occurs before the recryst. process starts. This temp. is a limit at which the complex of mech. properties described above does not occur.

J. Roviav Leach

**J. Roylar Leach**

KARGIN, V.A.; SOGOLOVA, T.I.

Investigation of mechanical properties of crystalline polymers. Part 3.  
Copolymers of chlorovinyl with chlorovinylidene and gutta-percha. Zhur.fiz.  
khim. 27 no.8:1213-1216 Ag '53. (MLRA 6:11)

1. Fiziko-khimicheskiy institut im. L.Ya.Karpova, Moskva.  
(Vinyl compounds) (Polymers and polymerization) (Gutta-percha)

*Kargin, V. A.*

Chemical Abstr.  
Vol. 48 No. 6  
Mar. 25, 1954  
General and Physical Chemistry

Packing densities of high-polymeric compounds. V. S. Kargin, V. A. Kargin, and A. I. Khramovskii. *U.S.S.R. Chem. Rev.* 1953, 27, 1217-27 (1953); *U.S.S.R. Chem. Rev.* 1953, 27, 1217-27 (1953); *U.S.S.R. Chem. Rev.* 1953, 27, 1217-27 (1953). This is a review of the literature on the packing densities of high-polymeric compounds, as well as for the solid forms of 27 of the monomers, in order to det. the mol. contraction ( $\Delta V$ ) and the packing coeffs.  $k_m$  and  $k_p$  for each. The symbols are defined by the equations:  $\Delta V = V_m - V_p$ ,  $k_m = V/V_m$ , and  $k_p = (V - x)/V_m$ , where  $V$  is the sum of the vols. of the atoms in the monomer (detd. from x-ray data),  $V_m$  and  $V_p$  are the mol. vols. of the monomer and polymer, resp., and  $x$  (about 8.0 cu. A.) is the vol. change due to bond formation;  $x$  is derived from the sum of at. vols. in one link of the polymeric chain. The max. and min. values of contraction found are 63.3 cc. per mole for  $C_{10}H_8$  and 10 cc. per mole for 2-vinylbenzofuran. The quantities  $\Delta V_p$  and  $\Delta V_m$ , defined as the lower limit of contraction and that due to the change in the packing coeff., resp., were also detd. The monomer d. polymer d.,  $V_m$ ,  $V_p$ ,  $\Delta V$ ,  $k_m$ ,  $k_p$ ,  $\Delta V_p$ ,  $\Delta V_m$ , and  $\Delta V/V_p$  are tabulated for all compds. studied. The degree of contraction is greater with flexible mol. chains than with rigid ones.

J. W. Lowenberg, Jr.

*MT 11-581*

KARGIN, V. A.

Chemical Abstracts  
Vol. 48 No. 5  
Mar. 10, 1954  
Synthetic Resins and Plastics

Electronographic investigation of crystalline polymers.  
1. Linear polymers. V. A. Kargin and G. S. Markova  
(U. S. S. R. Phys.-Chem. Inst., Moscow). *J. Phys.  
Chem. (U. S. S. R.)* 27, 1230-40 (1953); cf. *C.A.* 46, 3304h.—  
Polyamides made by the condensation of diamines contg.  
4-10 CH<sub>2</sub> groups with dicarboxylic acids contg. 4-8 CH<sub>2</sub>  
groups were studied by means of electron diffraction.  
Samples 100-1000 Å. thick were examd. with 60-kv. elec-  
trons. The observed identity periods in Å. are tabulated  
for 7 polyamides, a nylon copolymer, and 4 diamine salts  
of dicarboxylic acids. Polyamides have a highly regular  
structure, giving diffraction patterns similar in line width  
to those of cryst. org. compds. of low mol. wt. Diamine  
salts of dicarboxylic acids have a less regular structure.  
Polyamide diffraction patterns are very similar as regards  
the no. of reflexes and their intensities, differences in chain  
structure notwithstanding. J. W. Loweberg, Jr.

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7-27-54



KARGIN V.A.

# U S S R

## Electronographic study of crystalline polymers. II. Polyvinylidene chloride and a series of its copolymers.

V. A. Kargin and O. S. Markova (L. Ya. Kargin Phys.

~~Chem. Inst., Moscow~~; *Zhur. Fiz. Khim.* 27, 1525-9

(1953); cf. *C.A.* 48, 3061/. The interplanar distances of

polymers of vinyl chloride (I) and vinylidene chloride (II),

as well as 7 copolymers of mixts. of I and II contg. 10-85% II,

were detd. by electron diffraction. Data are tabulated

for as many as 10 planes. The regularity of polymer chains

is correlated with polar groups. The diffraction patterns

of all samples contg. 75% or more of II are identical. The

lack of dependence of the diffraction patterns on order in

the chain or on its parameters indicates that polymer crystals

consist of planes passing through polar groups in the

different chains; they are defect crystals, completely dis-

ordered in the 3rd dimension. J. W. Lowenberg, Jr.



KARGIN, V. A.

U S S R .

Mechanical properties of crystalline polymers. IV.  
Crystalline natural rubber. V. A. Kargin and T. I. Sego-  
lova (L. Ya. Karpov Phys.-Chem. Instn. Moscow). *Zhur.*  
*Fiz. Khim.* 27, 1320-4 (1953); *Ch. C.* 48, 14285b. The  
deformation of natural rubber was measured as a function of  
stress at several temps. between  $-80^{\circ}$  and  $40^{\circ}$ . Exptl.  
data are shown graphically for cryst. and amorphous natural  
rubber. Under stress the crystals do not act merely as inert  
filler but undergo phase transformation. J. W. L., Jr.

KARGIN, V. A.

Rubber Abstracts  
March 1954  
Synthetic Rubber  
and Like Products

1005. Deformation of crystalline polymers in a wide temperature range. V. A. KARGIN and L. I. SOCOLOVA. *Doklady Akad. Nauk U.S.S.R.*, 1953, 88, 887-7; *Chem. Abs.*, 1953, 47, 11888. Crystalline polymers like polyamides and polyethylene show three stages of behaviour when exposed to stress. Initially the strain increases, then follows a plateau of constant strain where the deformation increases a few hundred-fold (200-300%), and finally another increase takes place. During the second stage the sample becomes anisotropic and oriented; it shrinks in cross-section (neck-down). The strain level of the plateau is temperature dependent, its extent temperature independent. Stretch in two directions produces orientation along both. The transitions are very sharp for polyamides owing to the strong polar forces. Polyethylene curves show much more gradual transitions owing to weak interchain forces, especially at higher temperatures where the polymer appears to be more amorphous. 3S2D24.3423

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9-17-54

KARGIN, V. A.

259T87

USSR/Physics - Ultrasonic Absorption

11 Apr 53

"Absorption of Ultrasound in Solutions of Polymers,"  
Yu. Ya. Gotlib and M. V. Vol'kenshteyn

DAN SSSR, Vol 89, No 5, pp 821-824

Derivation and soln of the eqs describing the  
Kargin-Slonimskiy model (V. A. Kargin and G. L.  
Slonimskiy, DAN SSSR, Vol 62, No 2, 239 (1948);  
Zhur Fiz Khimii, 23, 5, 563 (1942)) of a net-like  
high polymer immersed in a soln as a sequence of  
sphere-segments connected by quasi-elastic forces  
of a statistical character. Presented by Acad A. N.  
Terenin 13 Feb 53.

259T87

KARGIN, V.A.

CH

The solidification mechanism of Bakelite resins. G. L. Dolady  
Golinskii, V. A. Kargin, and L. I. Gombenkova. *Doklady Akad. Nauk SSSR*, 211-14 (1983). Change in mech. properties of PhOH-HCHO resins in all solidification stages were studied with the application of the modern conceptions of the connection of properties and the structure of polymers by using dynamometer balances and other apparatus inside a wide range of temp., load, and time. The resins studied were the Resol, Resitol, and Resil grades of Dake life resins. Conclusions were drawn regarding their structure, solubility, temp. effects, etc. W. M. Sternberg

4  
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10/5/83

(2)

Kargin, V.A.

62 ✓ Discussion of fatigue in rubber. G. L. Slonimskii, V. A. Kargin, G. N. Bulko, E. V. Rextsova, and M. I'yuis-Ricra. *Doklady Akad. Nauk S.S.S.R.* 93, 523-4(1953).-- The fatigue of rubber is a complex phenomenon of interrelated chem. and phys. changes. Deformation causes a rupture of chain mols., with the formation of free chem. active radicals. Chem. reactions which proceed because of the existence of reactive groups and free radicals are accelerated by deformation because of the lowering of the activation energy and by increasing the possible no. of collisions. Chem. structure changes affect the mech. and rupture mechanisms of the material. Mech. forces bring about a reorientation of the vulcanization structure and produce anisotropy in the mech. properties of the material. Relaxation processes are superimposed upon this whole complex of processes. Gradual changes in the rubber properties during fatigue finally end in destruction of the material, which is not discussed in the article. W. M. S.

(4)

Scientific Conference at the Institute for Physical  
Chemistry Imeni L. Ya. Karpov.

64-1-18/19

M. I. Temkin and L. E. Apel'baum on the chain characteristics  
of heterogeneous catalytic reactions and professor G. K. Boreskov  
reported on: "Some Questions of Catalyst Selection."  
There are no references.

AVAILABLE: Library of Congress.

1. Chemical research-USSR
2. Scientific research-USSR

Card 3/3

APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000720710016-7"

Category: USSR/Chemistry of High-Molecular Substances

Abs Jour: Referat Zhur-Khimiya, No 9, 1957, 30890

Author : Kargin V.A., Gatovskaya T.V.

that the glass formed during the desorption process has a different structure, as compared with the initial, due to the plasticizing action of the monomer during sorption.

Card : 3/3

10/12/71  
The first stage of the process is the  
production of a polymer solution. This  
is done by dissolving a polymer in a  
solvent. The polymer is then added to  
the solution and the mixture is stirred  
for a period of time. The second stage  
is the precipitation of the polymer from  
the solution. This is done by adding a  
precipitant to the solution. The  
precipitant causes the polymer to  
precipitate out of the solution. The  
precipitate is then filtered out of the  
solution. The third stage is the  
drying of the precipitate. This is  
done by placing the precipitate in a  
drying oven. The drying oven is set  
at a temperature of 100 degrees  
Celsius. The precipitate is dried for  
a period of 24 hours. The final stage  
is the grinding of the dried precipitate  
into a fine powder. This is done by  
grinding the dried precipitate in a  
mortar and pestle. The final product  
is a fine powder of the polymer.

Karen, V.A.

Electron microscopic and x-ray examination of spherulitic formations and crystallites in crystalline polymers. V.A. Karen and L.A. Korotkaya. Dokl. Akad. Nauk SSSR, 110, 1011-1012 (1958); J. Polym. Sci. A, 43, 2814-2816 (1965). From polyethylene and a polyamide (copolymer of Kapra and nylon) films were produced that show spherulitic forms in the electron microscope. An evaporation rate not higher than 1 to 10 hrs. must be maintained. These spherulites are highly sensitive to electron irradiation, which in a short time destroys their structure irreversibly. The crystalline nature of the spherulites is evident from electron diffraction diagrams. They are, however, not simple aggregates grown of single crystallites but are direct crystals, products of the chain polymeric mass, that are subjected to a slow relaxation process. The rapid destruction of these aggregates by electron rays (amorphization) brings about in polyethylene and in the copolymer the formation of a network. The observation of the spherulites does not give any information on the sizes and shapes of the elementary crystals of the polymers. Better results are obtained from stretched films of the high polymers, and their electron microscopic examination with a shadow casting. Then they show intermittent transitions from isotropic to well-oriented polymers with a very fine fibrous structure, and excellent electron diffraction diagrams. These films are probably the crystalline elementary units of the high polymer.

W. B. Riel

PM

Kell



KARGIN, V.A.

MIKHAYLOV, N.V.; MAYBORODA, V.I.; KARGIN, V.A., akademik.

New method for the production of viscose fibers. Dokl. AN  
SSSR 111 no.3:656-658 N '56. (MLRA 10:2)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo  
volokna.

(Rayon) (Textile fibers, Synthetic)

KARGIN, V. A.

**Kinetics of hardening of phenol formaldehyde resins with hexamethylenetetramine.** L. A. Kargin, N. A. Kravchenko, and V. A. Kargin. *Doklady Akad. Nauk SSSR*, 1979, 249, 1437-1439. The authors have studied the kinetics of hardening of phenol formaldehyde resins with hexamethylenetetramine (HMT) in the absence and presence of various accelerators. The resins were used in a thermomechanical test of the resin. The samples were treated through a viscous stage immediately after casting, then hardened. The process is accompanied by increased modulus of the peak on the thermomechanical curve of hardening of the resin. It was shown that addition of 5% BaO or 5% BaCl<sub>2</sub> definitely accelerates the hardening process in the presence of hexamethylenetetramine. Addition of diphenylguanidine, thiuram disulfide, 2-mercaptobenzothiazole, i.e. typical rubber accelerators, also accelerates the setting of the resin. In the absence of hexamethylenetetramine these free-radical initiators are ineffective in setting the novolac resin even at 200°C. The authors conclude that the setting of novolac resin in the presence of hexamethylenetetramine is a free radical process. Time the setting of novolac resin is at least one stage is realized apparently through a free radical process.

G. M. Kosolapoff

to the same composition. The  $^{13}\text{C}$  NMR spectrum of  $\text{UO}_2(\text{DDES})_2 \cdot 11\text{H}_2\text{O}$  (No. 2) and  $\text{ZrO}_2(\text{DDES})_2 \cdot 11\text{H}_2\text{O}$  (No. 3) with complex-forming ability is shown in Figure 1. In both cases, the chemical shifts of the anodic peaks were 0.0016 and 0.0018 ppm different from the cathodic peaks at 40 mV, so that it is indicated that the complex is reversible and also, from usual results, on the other hand, of DDES and 0.58 ppm lower in  $\text{NH}_4\text{OH}$  (the cation, and the anion) than the peaks were equal (about 0.5 ppm). Selectivity of the stability of the complex were involved in  $\text{NH}_4\text{OH}$  solution.  $\text{UO}_2(\text{DDES})_2 \cdot 11\text{H}_2\text{O}$  is 0.0 ppm, and the cation  $\text{Zr}^{4+}$  establish in  $\text{ZrO}_2(\text{DDES})_2 \cdot 11\text{H}_2\text{O}$  were not reliable at all, and were not reliable in all cases.  $\text{UO}_2(\text{DDES})_2 \cdot 11\text{H}_2\text{O}$  and  $\text{ZrO}_2(\text{DDES})_2 \cdot 11\text{H}_2\text{O}$  the value and the corresponding

CH

KARGIN, V. A., and MARKOVA, G. S.

"Crystallization and orientation," a paper presented at the 9th Congress on the Chemistry and Physics of High Polymers, 20 Jan-2 Feb 57, Moscow. Inst. for Physical Chemistry, Acad. Sci. (Karpov Inst.)

E-3,084,395

KARGIN, V. A.

The curing process of phenol-formaldehyde resin (resin 1). The study of resins. V. A. Kargin, G. L. Bonimark and L. I. Golubenkova (Acad. Sci. USSR, Chem. Inst. Moscow). *Zhur. Prikl. Khim.* 30, 2435-40 (1956). The resins studied were condensation products of 8 mols. of phenol with 7 mols. of HCHO in the presence of  $\text{NH}_4\text{Cl}$  and the mech. properties at different polymerization depths during curing were studied. Reversible chain structures are important in the development of mech. properties of resins and interactions are spread widely in the production of high elastic plastics. Chain structures are formed from internal structure and at high temp. resins behave like low-mol. amorphous substances, and at low deformation, like linear polymers. The formation and breakdown of the phys. chains are manifested in the sharply reversible relation of the resin viscosity to stress (viscosity being reduced at high stress), and the disappearance of the highly elastic condition at higher stresses.

W. M. Sternberg

Math

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KARGIN, V.A.

1953. (Structure of Gels.) Special studies of Addition to Mechanical Properties of Gels and Solutions of Gels. (Vilenskaya razrabotka) no. 2, 1953. Includes graphs. 3 refs.   
 Zolotarev, P. I. and V. A. Kargin. *Kolloidnyi Zhurnal* v. 15, no. 3, Mar-Apr 1953, p. 305-310.   
 IV. (Effect of Addition to Mechanical Properties of Gels and Solutions of Gels.)   
 Zolotarev, P. I. and V. A. Kargin. *Kolloidnyi Zhurnal* v. 15, no. 3, Mar-Apr 1953, p. 305-310.   
 Includes graphs. 3 refs.

Category: USSR/Chemistry of High-Molecular Substances

F

Abs Jour: Referat Zhur-Khimiya, No 9, 1957, 30890

Author : Kargin V.A., Gatovskaya T.V.

of monomer, which exercises a plasticizing action, the polymer is changed to a highly elastic state and the process of sorption begins to reach one of entropy nature. In the case of densely packed glasses the first portion is not attained. Sorption begins when the amount of monomer sorbed at the surface becomes sufficient to fuse the glass and change the polymer to an elastic state. Such polymers include polymethyl-methacrylate, polyvinyl alcohol, polyacrylic acid. Nature of the transition from 1-st portion to the 2-nd is determined by properties of the polymer. Thus the fundamental factor which determines sorption of vapor by polymeric glasses is packing density of the chains and change in physical state on sorption. Hysteresis phenomena on desorption are due to change in physical state of polymer, as a result of which the surface layer is vitrified which hinders diffusion from the bulk of the polymer. The assumption is made

Card : 2/3

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KARGIN, V.A.

Category: USSR/Chemistry of High-Molecular Substances

F.

APPROVED FOR RELEASE: 06/13/2000, 30890 CIA-RDP86-00513R000720710016-7"

Author : Kargin V.A., Gatovskaya T.V.

Inst : ~~not given~~

Title : Sorption of Hydrogenated Monomers by Amorphous Polymers in Vitreous State

Orig Pub: Zh. fiz. khimii, 1956, 30, No 9, 2051-2056

Abstract: Study of sorption of hydrogenated monomers by polymers in the vitrification state (polyacrylic acid - propionic acid, polyvinyl alcohol - ethanol, polyvinyl chloride - ethyl chloride, polymethylmethacrylate - methylester of isobutyric acid, polybutylacrylate - butyl ester of isobutyric acid and polystyrene - benzene). Sorption isotherms are characterized by presence of two portions over the first of which true sorption occurs as a result of micro-porosity of the material. Loosely packed glasses behave like true adsorbents up to the point at which all micropores become filled with monomer; with accumulation

Card : 1/3

-4-



KARGIN, V. A.

2810. Sorption of low molecular substances by amorphous polymers to a highly elastic state. Kargin, V. A. and T. V. Il'yashova. Zh. fiz. khim. 1956, 30, 1852-4. N-hexane sorption polymers are plotted for natural rubber, a polyisoprene, and its high-molecular fraction, SKIM, and a high-molecular fraction of SKBA, SR-1, SR-2 and SR-3, and for natural rubber and polyisoprene vulcanizates. In spite of the difference in the structure of the chains of natural and synthetic rubbers, all the sorption isotherms give the same curve. It is concluded that the branching of the chains of synthetic rubber is only slight and practically does not change the degree of flexibility of the chains in comparison with those of natural (linear) rubber. The presence of an uncommon spatial network (vulcanized rubber test pieces) also does not alter the flexibility of the chains. 62161

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KARGIN, V.A.; SOGOLOVA, T.I.; SLONIMSKIY, G.L.; REBTSOVA, Ye.V.

The mechanism of fluidity of polymer formation. Zhur.fiz.khim. 30  
no.8:1903 Ag '56. (MIRA 10:1)

1. Fiziko-khimicheskiy institut imeni L.Ya.Karpova i Institut  
shinnoy promyshlennosti, Moskva.  
(Polymers)

*KARGIN, V. A.*

Category : USSR/Atomic and Molecular Physics - Physics of High- Molecular Substances. D-9

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6450

Author : Lipatov, Yu.S., Kargin, V.A., Slonimskiy, G.L.  
Inst : Physical Institute Ioni L.Ye. Karpov, Moscow.  
Title : Investigation of the Orientation in High Polymers. II. Crystalline Polymers.

Orig Pub : Zh. fiz. khimii, 1956, 30, No 6, 1202-1206

Abstract : The heats of dissolution of oriented and non-oriented polyethylene, caprone, gutta-percha, and a copolymer of vinyl chloride and chlorvinylethane have been determined. It is shown that there is no substantial change in the ratio of the amorphous and crystalline phases upon orientation. It is suggested that the processes of cold drawing of crystalline polymers has a kinetic character. Comparison of data on crystalline and amorphous polymers leads to the conclusion that the kinetic character of the establishment of equilibrium in the system upon orientation is common to both groups

Card : 1/2

Molecular Substances. Physics of High- D-9

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6450

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000720710016-7"

of polymers, in both cases the primary act is the disturbance of the equilibrium in the location of the links of the polymer chain, followed by the formation of crystalline-ordered or geometrically-ordered regions, oriented in a definite direction.

Card : 2/2

Abstract : A determination of the equilibrium of orientation of polymers were made for oriented and unoriented films of polystyrene, polyvinyl chloride, polymethyl metacrylate, and cellulose acetate (the latter also in the form of acetate silk). The results obtained show that the orientation of the first three polymers decreases the packing density, and orientation of the cellulose acetate causes it to increase. This is explained by the kinetic nature of the re-grouping processes of the molecules upon orientation and their dependence on the flexibility of the chain, on the magnitude of the intermolecular forces, and on the deformation conditions.

KARGIN, V. A.

Category : USSR/Optics - Spectroscopy

K-6

Abs Jour : Ref Zhur - Fizika, No 2, 1957, No 5117

Author : Markova, G.S., Sadoyskaya, G.K., Kargin, V.A.

Inst : Physicochemical Institute, Moscow

Title : Change in Infrared Absorption Spectra Upon Softening and Hardening of Crystalline and Amorphous Polymers.

Orig Pub : Zh. fiz. khimii, 1956, 30, No 2, 437-441

Abstract : An investigation was made of gutta-percha polytrifluor-chlorethylene, polystyrol, polydichlorstyrol, polyvinyl chloride, and polymethylmetacrylate. A sharp change in the spectra in the vicinity of the melting temperatures of polymers was established for crystalline polymers. The spectra of the amorphous polymers do not experience any changes all the way to temperatures that are known to exceed the softening temperature of the substances. Spectra of the investigated substances at various temperatures are shown. A method is described for preparing the specimen. It is shown that the melting of polymer crystals exhibits no specific difference from the melting of crystals of low-molecular substances.

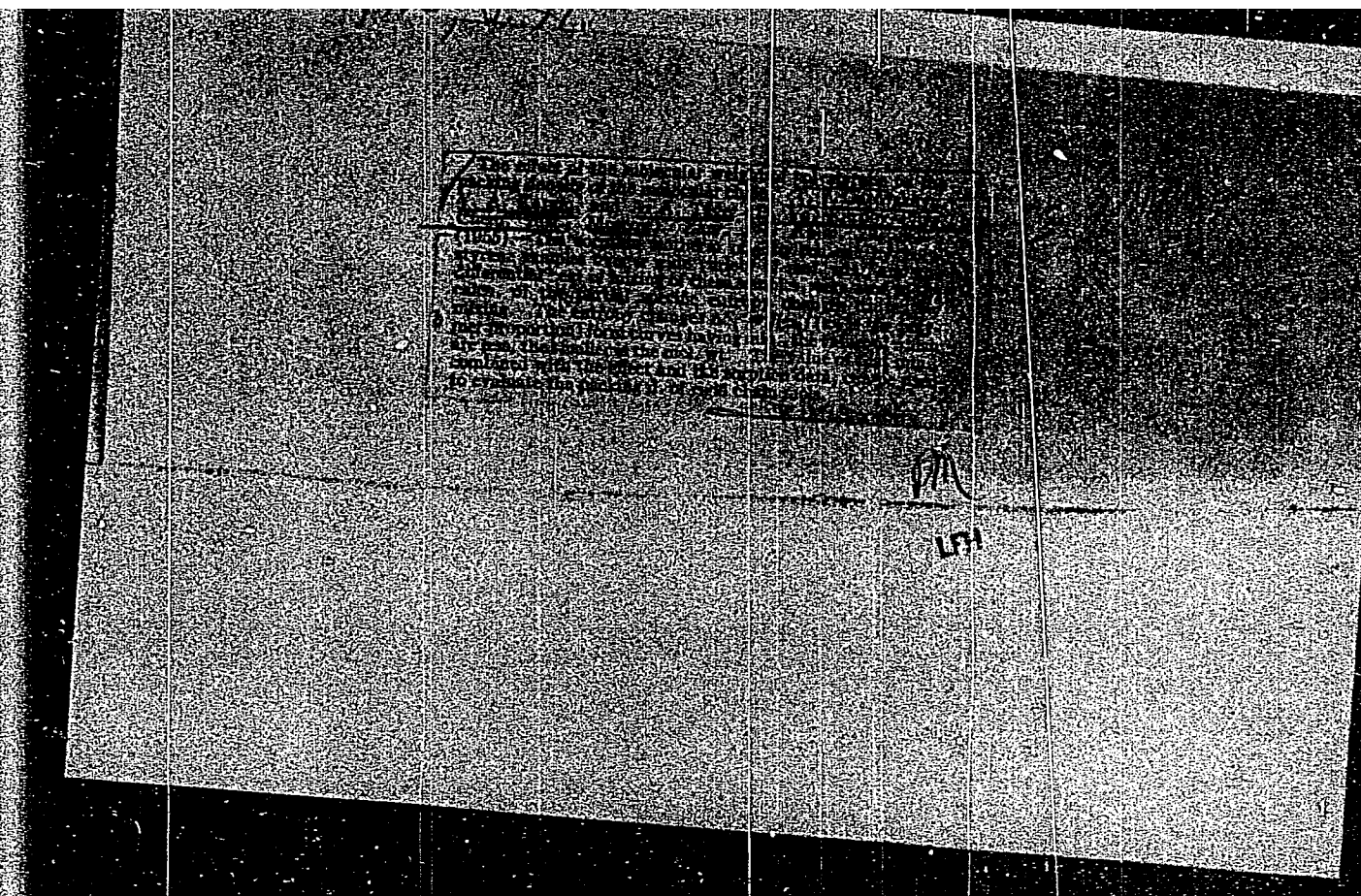
Card : 1/1

Žurn.techn.fis,26, fasc.12, 2684-2689 (1956) CARD 2 / 2

PA - 1822

tions of individual fibres remain unknown. The values obtained are shown in form of a table. By means of the pendulum ram the following tests can be carried out: Determination of the tearing characteristics of the cord subjected to impact and/or several impacts. In the course of the process the following quantities can be determined: the amount of energy needed for tearing the fibre; the amount of the elongation of the fibre; the duration of impact and, in the case of several impacts, also the number of impacts as well as the quantity of the common remaining and elastic deformations.

INSTITUTION: The Scientific Research Institute of the Automobile Tire Industry, Moscow.



KARGIN, V.A.; GATOVSKAYA, T.V.

Sorption properties of crystalline polymers. Zhur.fiz.khim.29  
no.5:889-891 My'55. (MLRA 8:12)

1. Fiziko-khimicheskiy institut imeni L.Ya.Karpova, Moscow  
(Polymers and polymerization) (Sorption)

KARGIN V. A.

U S S R .

10929\* Influence of Molecular Weight on the Mechanical Properties of Crystalline Polymers. Vliyanie molekuliarnogo vesa na mekhanicheskie svoystva kristallicheskikh polimerov. (Russian.) V. A. Kargin and T. I. Sogolova. *Zhurnal Fizicheskoi Khimii*, v. 29, no. 3, Mar. 1955, p. 469-475. Properties of polyethylene and polyamide crystals. Graphs, tables, 5 ref.

5

2

Gal structure. V. Preparation of globular casein.  
 P. I. Zubov, Z. N. Zhuravskaya, and V. A. Kargin (U.S.S.R.).  
 Karpov Inst. Phys. Chem., Moscow, U.S.S.R. (1954).  
 179-80 (1954). Cf. C. A. 44, 4044. Ordinary casein (11 was  
 dissolved in 0.1N Ba(OH)<sub>2</sub> at 50°, the soln. was left to  
 0.2%, kept at 50° for 16 min., cooled to 0-5°, and left with  
 0.1N H<sub>2</sub>SO<sub>4</sub>; then BaSO<sub>4</sub> was removed by centrifugation and  
 the liquid evapd. in a vacuum. The casein (II) thus ob-  
 tained was sol. in cold H<sub>2</sub>O. Films from H<sub>2</sub>O-glycerol solns.  
 of II had a smaller tensile strength and a much smaller total  
 elongation than films from I. The viscosity of aq. solns. of  
 II (up to 0.5%) was comparable to that of H<sub>2</sub>O. I and II  
 sorbed H<sub>2</sub>O vapor equally well. The isoelec. point of II  
 (from titration) showed that some basic groups disappeared  
 in the formation of globular protein. J. J. Bikerman

V. A. KARGIN